HITACHI

SERVICE MANUAL

TK | **No. 3010E**

VM-3200E, E(AV), E(UK)
VM-3280E(AV), E(AU)

Technical Data

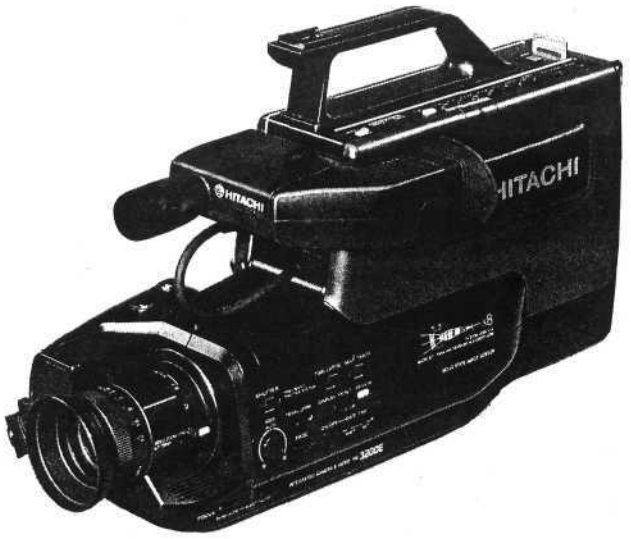


PHOTO:VM-3200E

MANUAL RELATED TO THE VM-3200E/VM-3280E

TITLE	MODEL	MANUAL No.
Technical Information	VM-3200E SERIES	No. 3012E
RF UNIT	VM-RF70E	No. 3073E
POWER ADAPTER /CHARGER	VM-AC61E	No. 3073E

VHS

This video deck is a VHS type video recorder. For proper operation, only the VHS type cassette must be used.

SPECIFICATIONS

■ **General**

Power requirements	9.6V DC
Power consumption	9.5 watts (When AUTO/MAN FOCUS switch is "MAN".)
Dimensions	127(W) x 235(H) x 378(D) mm
Weight	2.4 kg

■ **Video Recorder Section**

Format	VHS
Record/playback system	2 video record/playback heads
Video signal	PAL colour & CCIR monochrome signals 625 lines
Tape speed	23.39 mm/sec.
Video output	1.0 Vp-p, 75 ohm
Mic input	−68 dBs, more than 1K ohm
Audio output	−8 dBs, less than 1K ohm
Earphone output	−26 dBs, (8 ohms terminal)
Fast forward/rewind time	Less than 8 minutes with E-180 cassette

■ **Camera Section**

Scanning	625 lines/50 fields/25 frames
Required minimum illumination	7 lux
Camera device	1/2" C.C.D
Lens diameter	46 mm

SAFETY PRECAUTIONS

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine Hitachi replacement parts. Especially critical parts in the power circuit block should not be replaced with other makers'! Critical parts are marked with ⚠ in the schematic diagram.
2. Before returning a repaired unit to the customer, the service technician must thoroughly test the unit to ascertain that it is completely safe to operate without danger of electrical shock.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

VIDEO CASSETTE RECORDER

February 1989 TOKAI WORKS

high frequencies are increased resulting in distortion. When the level is too high, high frequencies are attenuated.

Test Points: TP401 Main
TP402 (GND) Main

Adjust:
RT402 (AUDIO BIAS LEVEL) Main

Observe: Millivoltmeter

1. Connect the millivoltmeter to TP401. (Ground the TP402 on the audio circuit board)
2. Set the PLAYBACK/CAMERA switch to the CAMERA position.
3. Load the instrument with a blank tape.
5. Place the instrument in the "Record" mode.
6. Adjust RT402 for 2.4mVrms ± 0.1mVrms

3-9. ADJUSTMENT PARTS LOCATION

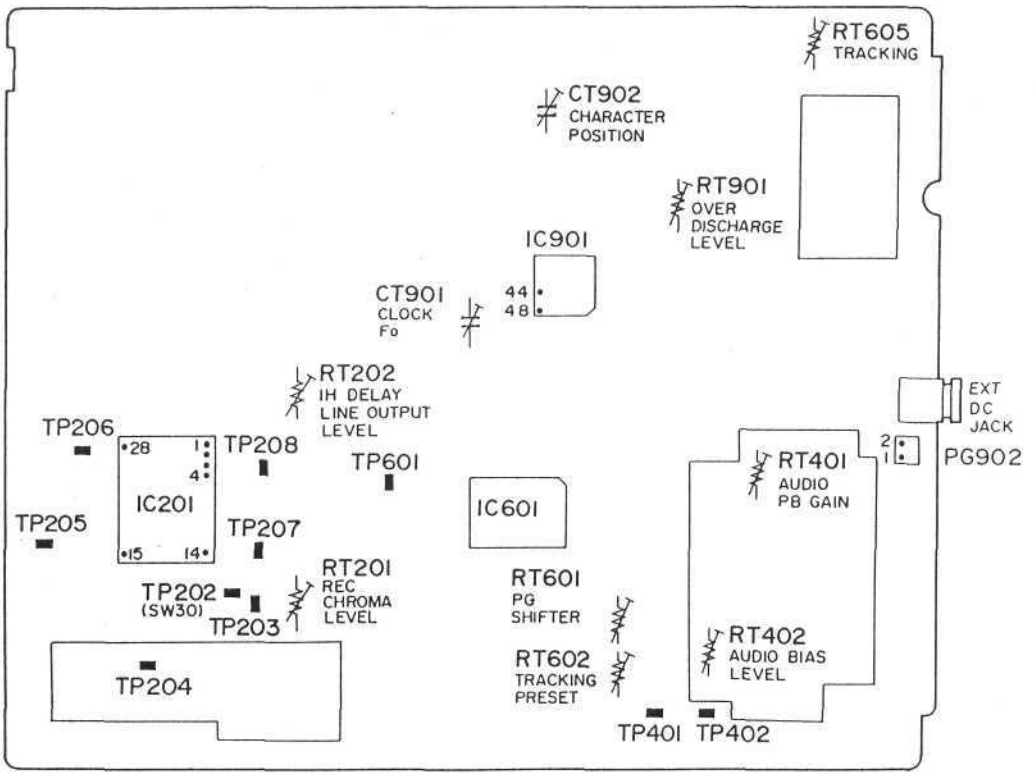
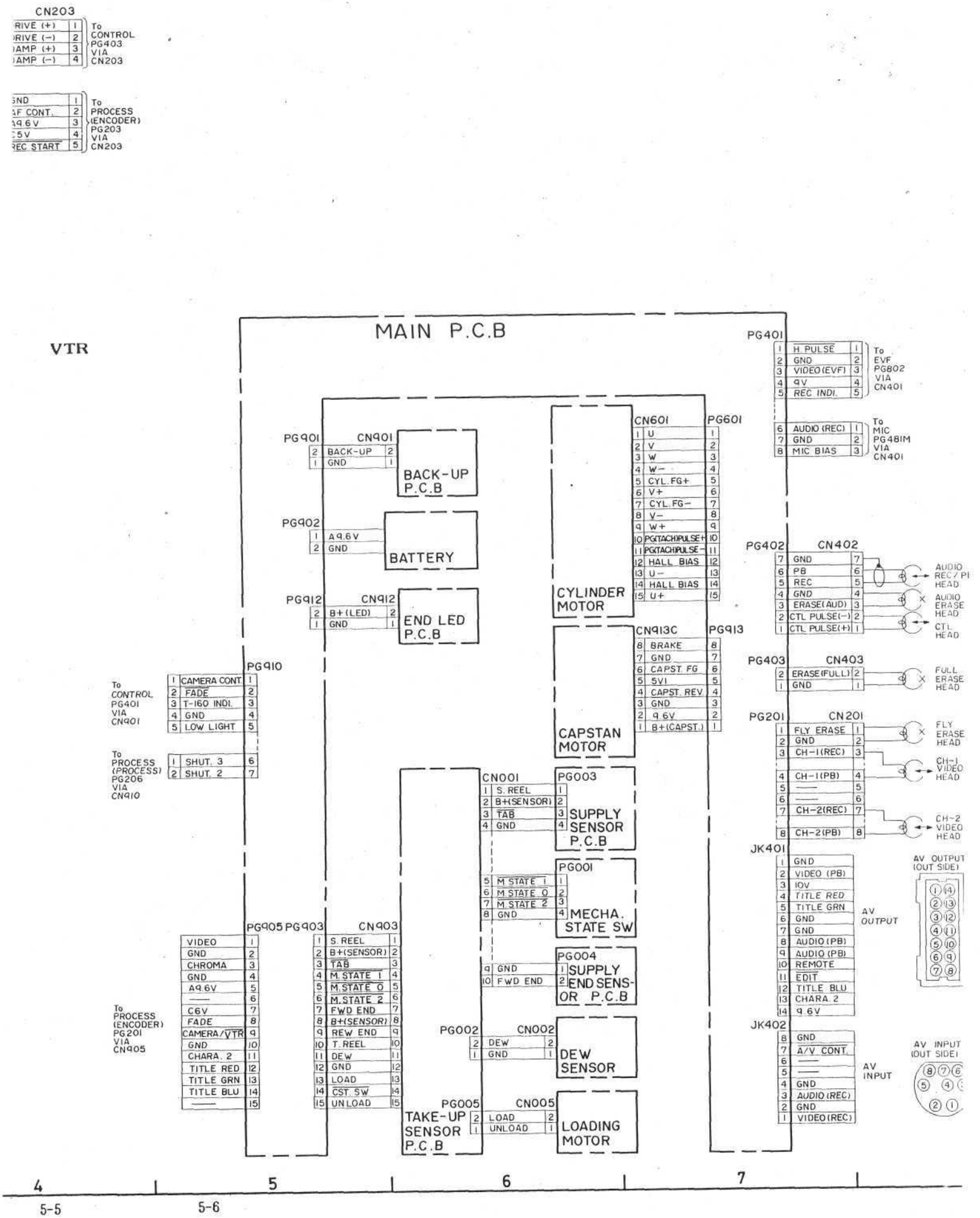
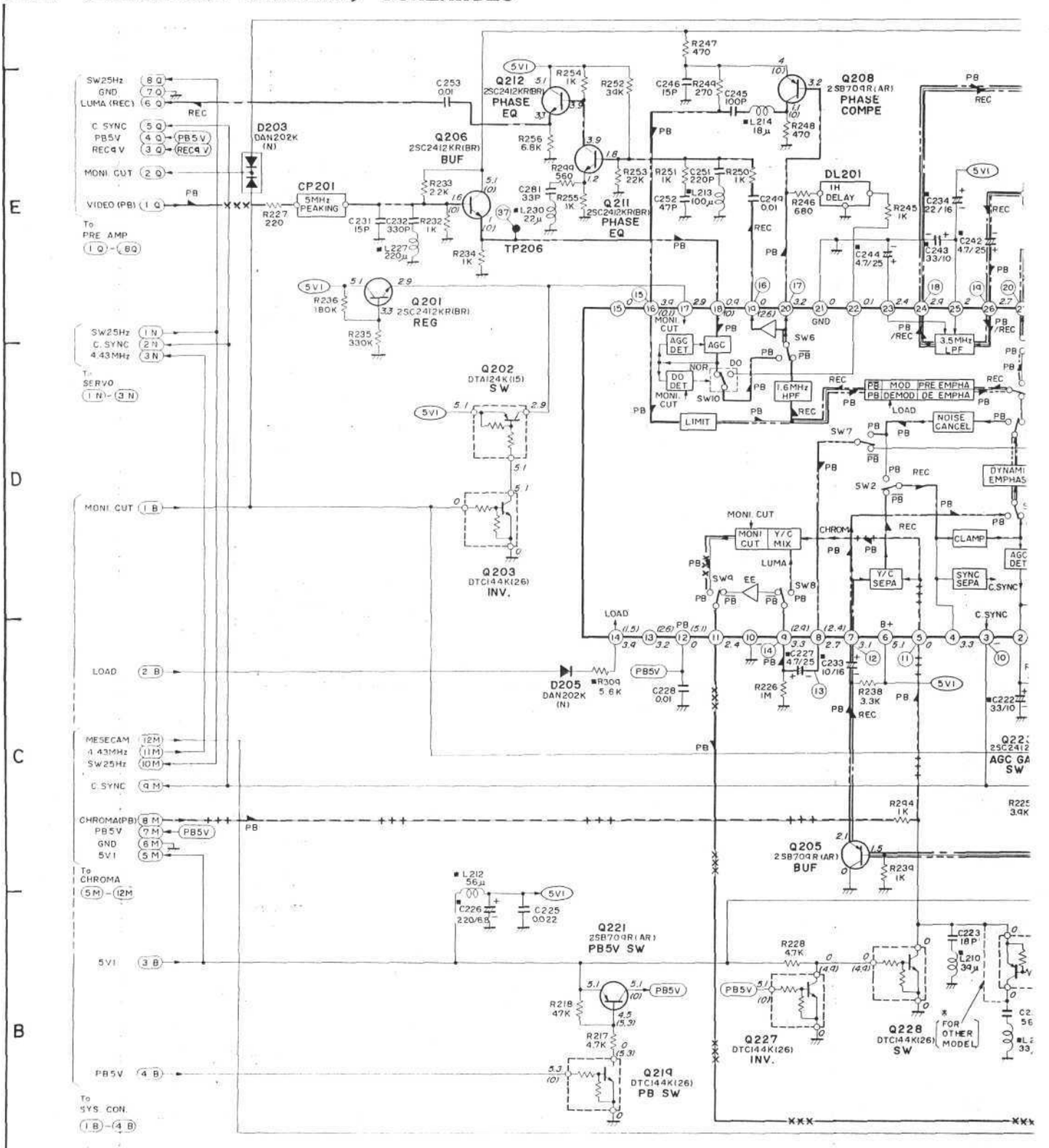


Fig. 4-151 Main Circuit Board
(Solder Side)


CN203
RIVE (+) 1
RIVE (-) 2
AMP (+) 3
AMP (-) 4
To CONTROL PG403 VIA CN203
GND 1
F CONT. 2
9.6 V 3
5V 4
EC START 5
To PROCESS (ENCODER) PG203 VIA CN203
VTR
MAIN P.C.B
PG401
1 H. PULSE 1
2 GND 2
3 VIDEO(EVF) 3
4 9V 4
5 REC INDI. 5
To EVF PG802 VIA CN401
6 AUDIO (REC) 1
7 GND 2
8 MIC BIAS 3
To MIC PG48IM VIA CN401
PG901 CN901
2 BACK-UP 2
1 GND 1
BACK-UP P.C.B
PG902
1 A9.6V
2 GND
BATTERY
PG912 CN912
2 B+(LED) 2
1 GND 1
END LED P.C.B
CN601 PG601
1 U 1
2 V 2
3 W 3
4 W- 4
5 CYL.FG+ 5
6 V+ 6
7 CYL.FG- 7
8 V- 8
9 W+ 9
10 PGTACHPULSE+ 10
11 PGTACHPULSE- 11
12 HALL BIAS 12
13 U- 13
14 HALL BIAS 14
15 U+ 15
CYLINDER MOTOR
CN913C PG913
8 BRAKE 8
7 GND 7
6 CAPST.FG 6
5 5VI 5
4 CAPST.REV 4
3 GND 3
2 9.6V 2
1 B+(CAPST.) 1
CAPSTAN MOTOR
PG910
To CONTROL PG401 VIA CN901
1 CAMERA CONT. 1
2 FADE 2
3 T-160 INDI. 3
4 GND 4
5 LOW LIGHT 5
To PROCESS (PROCESS) PG206 VIA CN910
1 SHUT. 3 6
2 SHUT. 2 7
CN001 PG003
1 S.REEL 1
2 B+(SENSOR) 2
3 TAB 3
4 GND 4
SUPPLY SENSOR P.C.B
PG001
5 M.STATE 1 1
6 M.STATE 0 2
7 M.STATE 2 3
8 GND 4
MECHA. STATE SW
PG004
9 GND 1
10 FWD END 2
SUPPLY END SENSOR P.C.B
PG905 PG903 CN903
VIDEO 1
GND 2
CHROMA 3
GND 4
A9.6V 5
6
C6V 7
FADE 8
CAMERA/VTR 9
GND 10
CHARA. 2 11
TITLE RED 12
TITLE GRN 13
TITLE BLU 14
15
1 S.REEL 1
2 B+(SENSOR) 2
3 TAB 3
4 M.STATE 1 4
5 M.STATE 0 5
6 M.STATE 2 6
7 FWD END 7
8 B+(SENSOR) 8
9 REW END 9
10 T.REEL 10
11 DEW 11
12 GND 12
13 LOAD 13
14 CST.SW 14
15 UNLOAD 15
To PROCESS (ENCODER) PG201 VIA CN905
PG002 CN002
2 DEW 2
1 GND 1
DEW SENSOR
PG005 CN005
TAKE-UP SENSOR P.C.B
2 LOAD 2
1 UNLOAD 1
LOADING MOTOR
PG402 CN402
7 GND 7
6 PB 6
5 REC 5
4 GND 4
3 ERASE(AUD) 3
2 CTL PULSE(-) 2
1 CTL PULSE(+) 1
AUDIO REC / PB HEAD
AUDIO ERASE HEAD
CTL HEAD
PG403 CN403
2 ERASE(FULL) 2
1 GND 1
FULL ERASE HEAD
PG201 CN201
1 FLY ERASE 1
2 GND 2
3 CH-1(REC) 3
4 CH-1(PB) 4
5 5
6 6
7 CH-2(REC) 7
8 CH-2(PB) 8
FLY ERASE HEAD
CH-1 VIDEO HEAD
CH-2 VIDEO HEAD
JK401
1 GND
2 VIDEO (PB)
3 10V
4 TITLE RED
5 TITLE GRN
6 GND
7 GND
8 AUDIO (PB)
9 AUDIO (PB)
10 REMOTE
11 EDIT
12 TITLE BLU
13 CHARA. 2
14 9.6V
AV OUTPUT
AV OUTPUT (OUT SIDE)
JK402
8 GND
7 A/V CONT.
6 —
5 —
4 GND
3 AUDIO (REC)
2 GND
1 VIDEO (REC)
AV INPUT
AV INPUT (OUT SIDE)
4
5
6
7
5-5
5-6

MAIN (LUMINANCE SECTION) SCHEMATIC



NOTE MARK " ■ " IS DISCRETE COMPONENT.

—×— : REC VIDEO SIGNAL —×××— : PB VIDEO SIGNAL — – – – : REC LUMA SIGNAL — – – – : PB LUMA SIGNAL —–+++–: PB CH

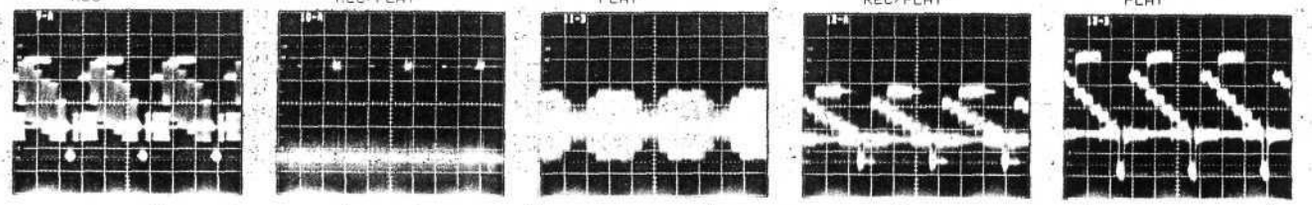
9-A IC202-1 890mVp-p 0.2V/20.0μ sec.cm REC

10-A IC202-3 4.1Vp-p 1V/20.0μ sec.cm REC/PLAY

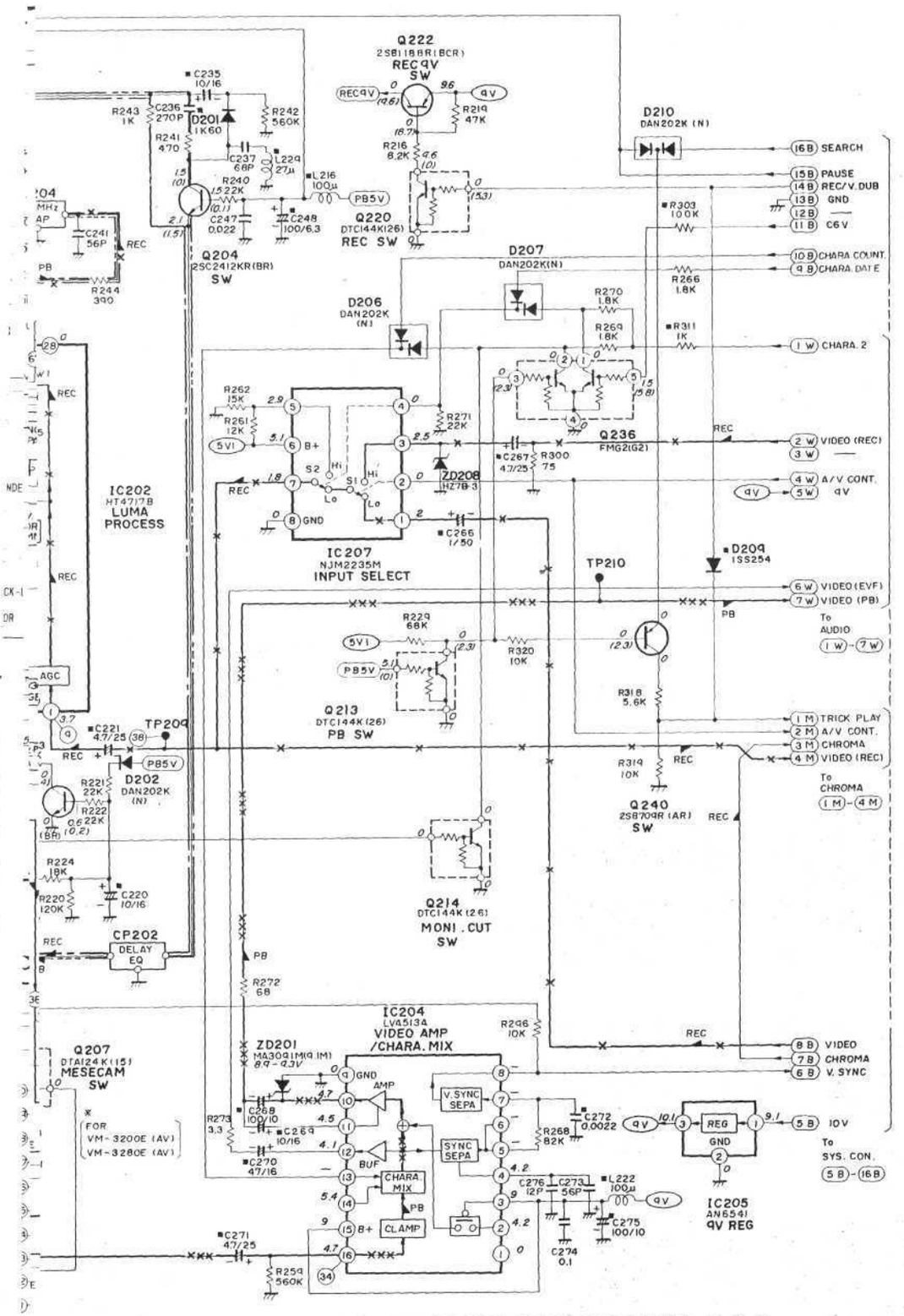
11-B IC202-5 320mVp-p 0.1V/20.0μ sec.cm PLAY

12-A IC202-7 330mVp-p 0.1V/20.0μ sec.cm REC/PLAY

13-B IC202-8 1.1Vp-p 0.2V/20.0μ sec.cm PLAY

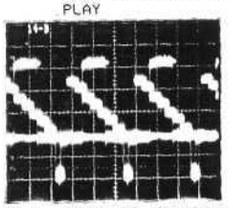


1 2 3 4

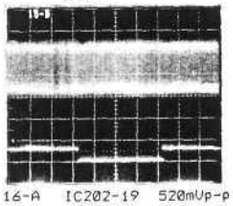


MAIN(LUMINANCE SECTION) P.C.B

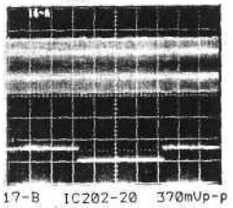
14-B IC202-9 1.1Vp-p
0.2V/20.0μ sec.cm
PLAY



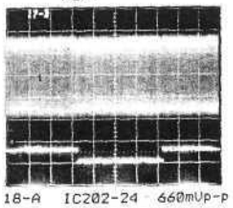
15-B IC202-16 240mVp-p
0.1V/5.0msec.cm
PLAY



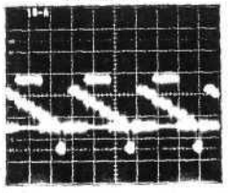
16-A IC202-19 520mVp-p
0.2V/5.0msec.cm
REC



17-B IC202-20 370mVp-p
0.1V/5.0msec.cm
PLAY

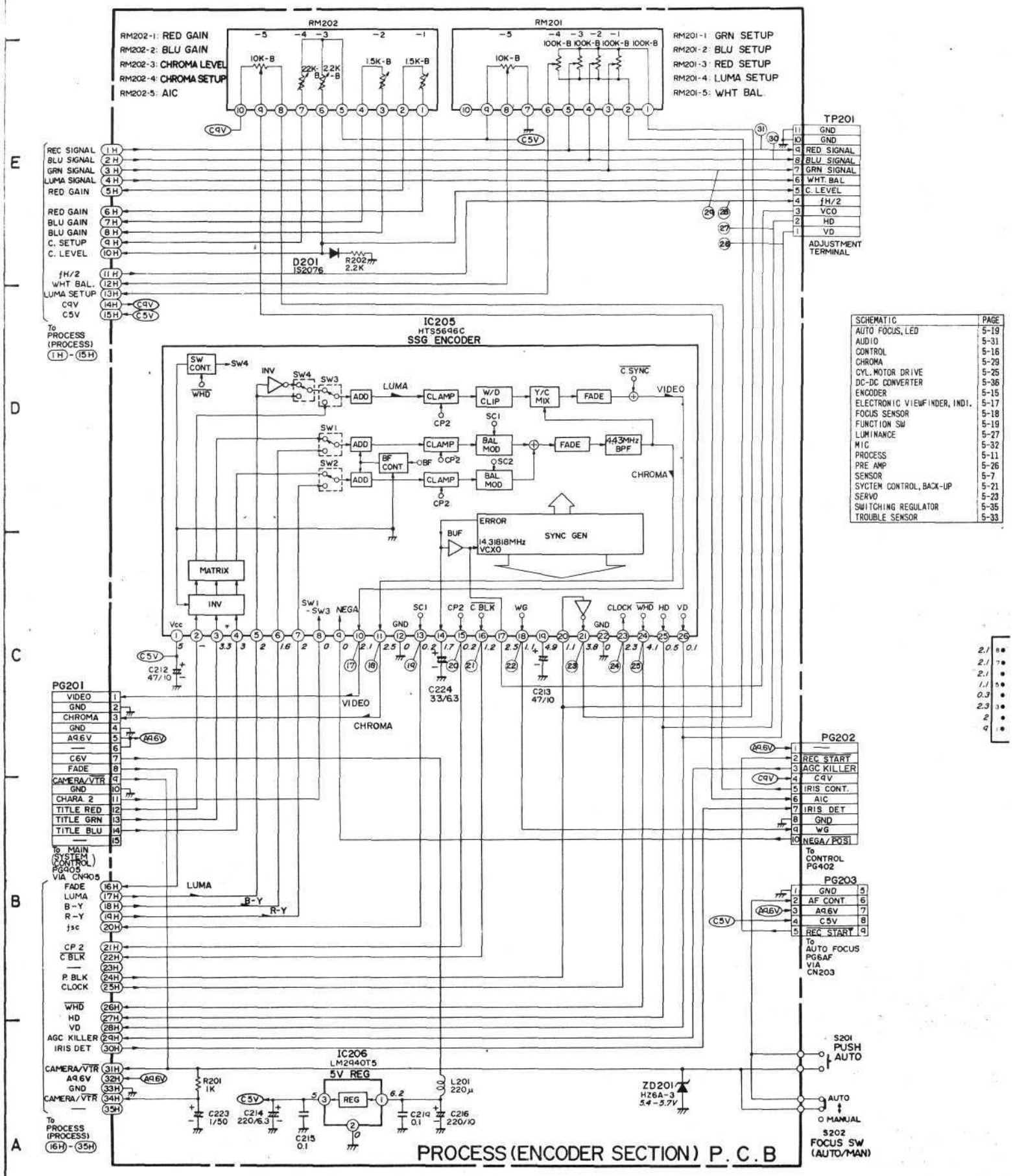


18-A IC202-24 660mVp-p
0.2V/20.0μ sec.cm
REC/PLAY



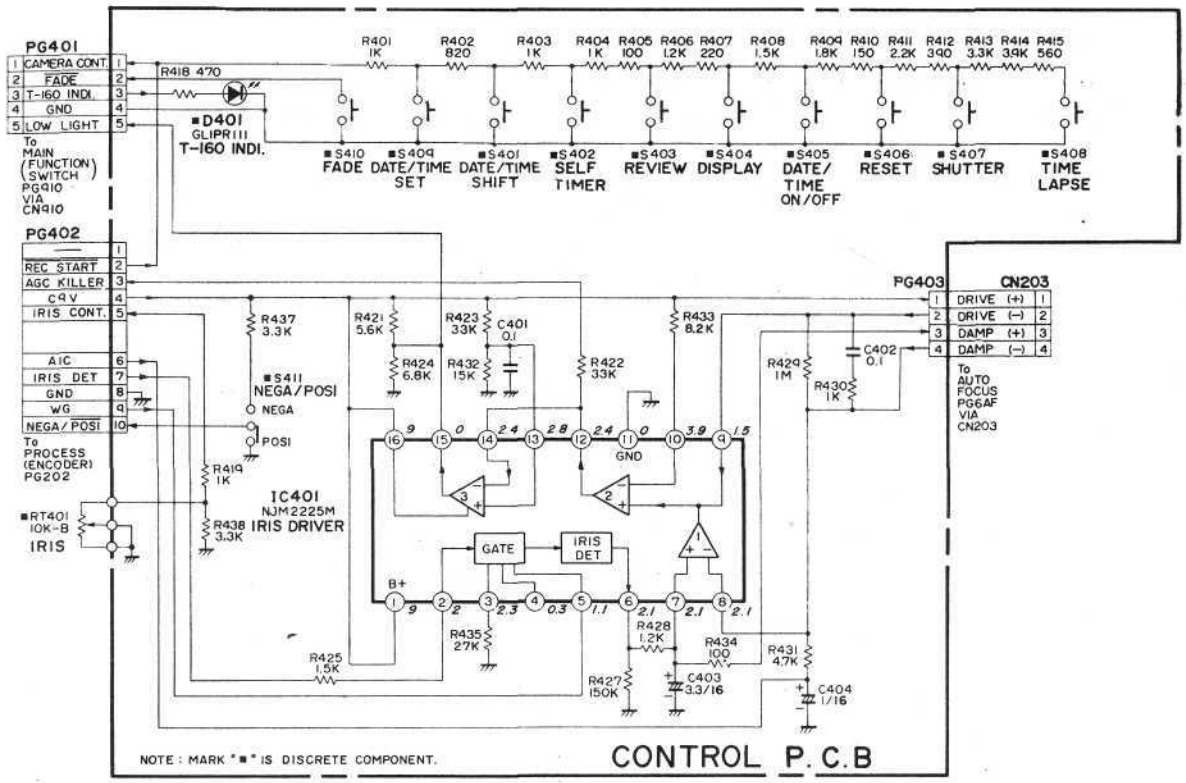
SCHEMATIC	PAGE
AUTO FOCUS, LED	5-19
AUDIO	5-31
CONTROL	5-16
CHROMA	5-29
CYL. MOTOR DRIVE	5-25
DC-DC CONVERTER	5-36
ENCODER	5-15
ELECTRONIC VIEWFINDER, INDI.	5-1
FOCUS SENSOR	5-11
FUNCTION SW	5-1
LUMINANCE	5-2
MIC	5-3
PROCESS	5-1
PRE AMP	5-2
SENSOR	5-7
SYCTEM CONTROL, BACK-UP	5-
SERVO	5-
SWITCHING REGULATOR	5-
TROUBLE SENSOR	5-

PROCESS (ENCODER SECTION) SCHEMATIC



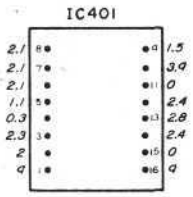
SCHEMATIC	PAGE
AUTO FOCUS, LED	5-19
AUDIO	5-31
CONTROL	5-16
CHROMA	5-29
CYL. MOTOR DRIVE	5-25
DC-DC CONVERTER	5-36
ENCODER	5-15
ELECTRONIC VIEWFINDER, INDI.	5-17
FOCUS SENSOR	5-18
FUNCTION SW	5-19
LUMINANCE	5-27
MIC	5-32
PROCESS	5-11
PRE AMP	5-26
SENSOR	5-7
SYCTEM CONTROL, BACK-UP	5-21
SERVO	5-23
SWITCHING REGULATOR	5-35
TROUBLE SENSOR	5-33

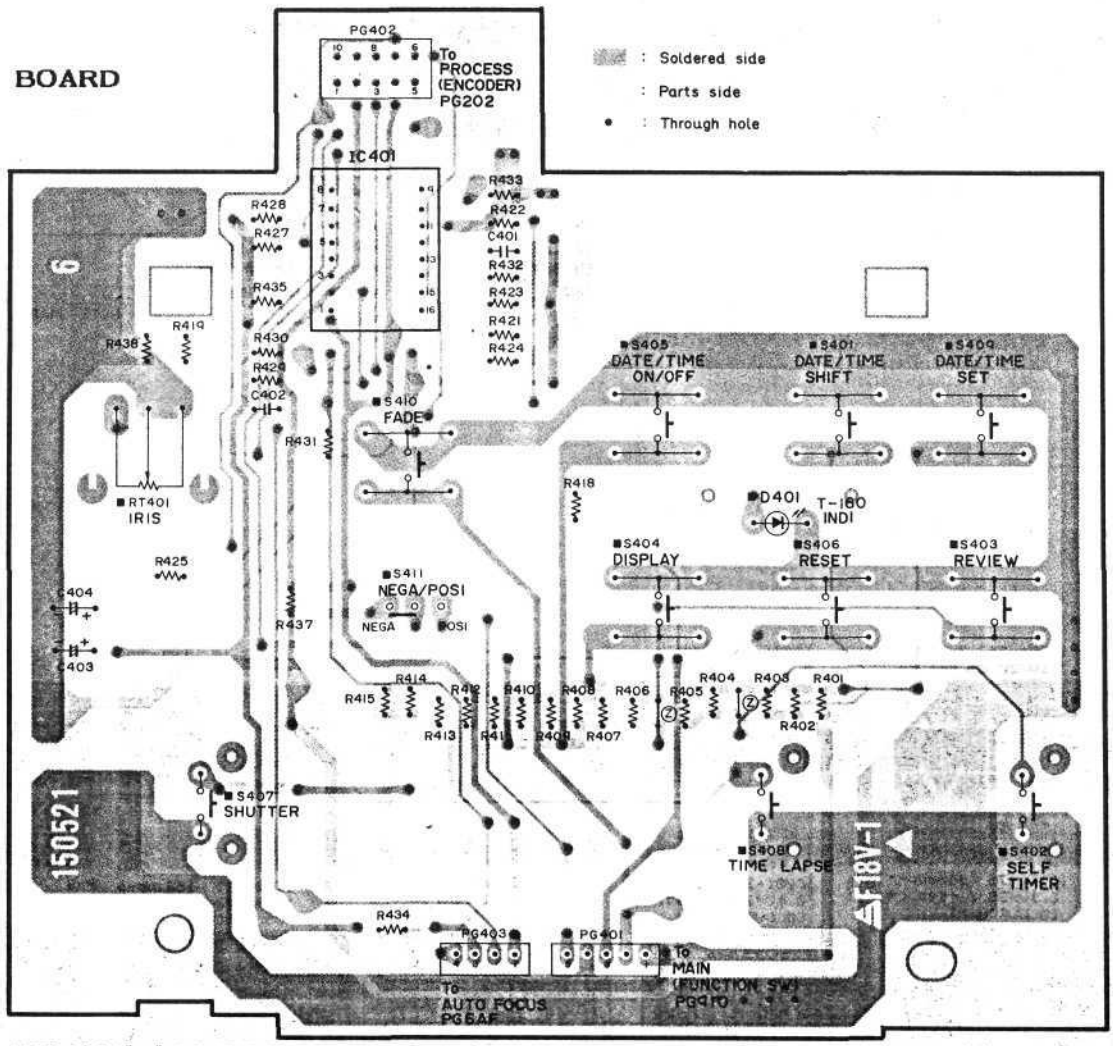
CONTROL SCHEMATIC



	PAGE
	5-19
	5-31
	5-16
	5-29
	5-25
	5-36
	5-15
INDER, INDI.	5-17
	5-18
	5-19
	5-27
	5-32
	5-11
	5-26
	5-7
ACK-UP	5-21
TOR	5-23
	5-35
	5-33

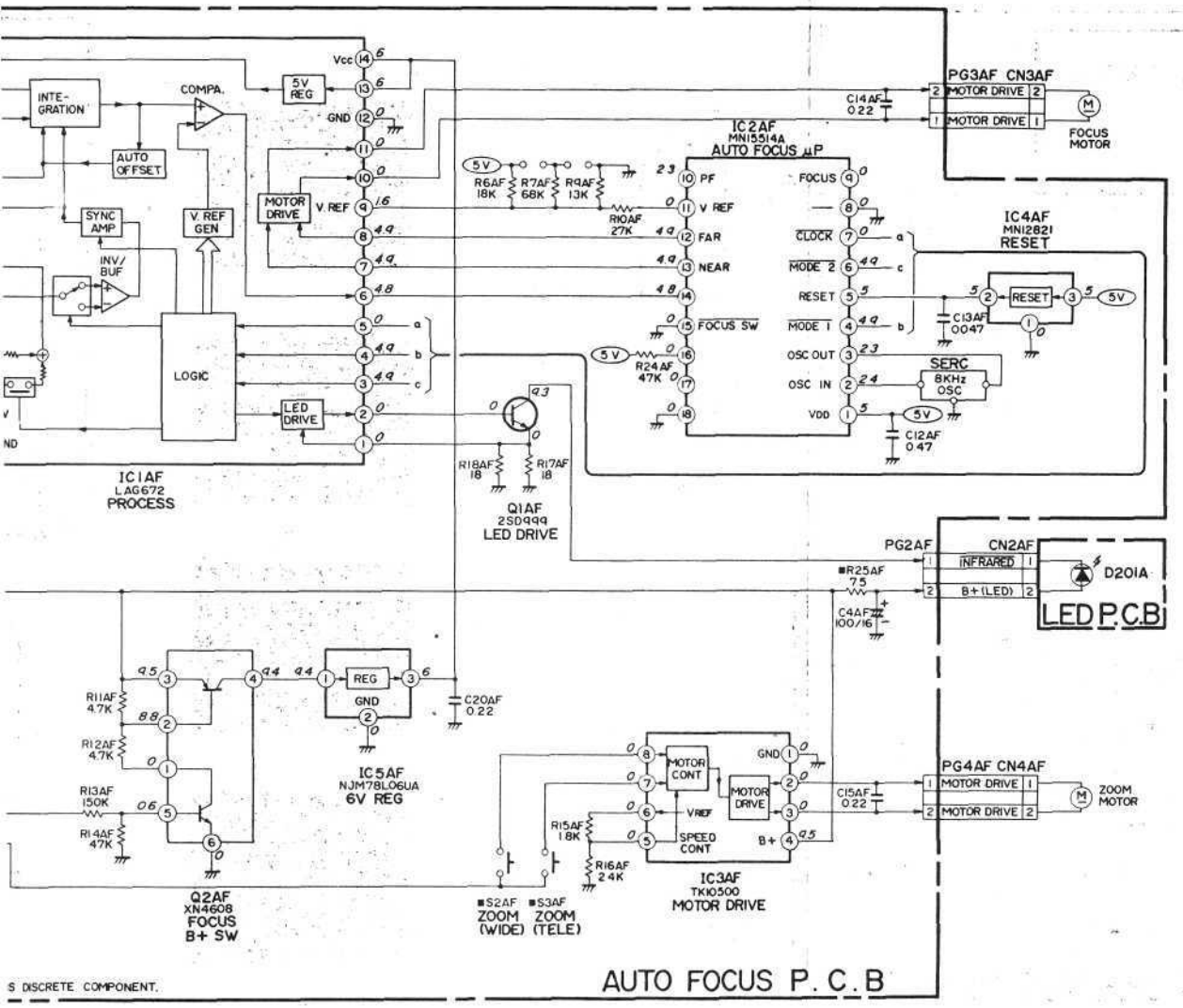
CONTROL CIRCUIT BOARD

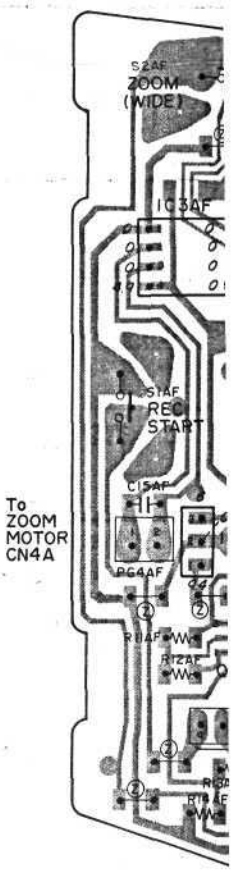




NOTE : MARK "■" IS DISCRETE COMPONENT.
MARK "Ⓩ" IS LEADLESS (CHIP) JUMPER.

CONTROL P.C.B



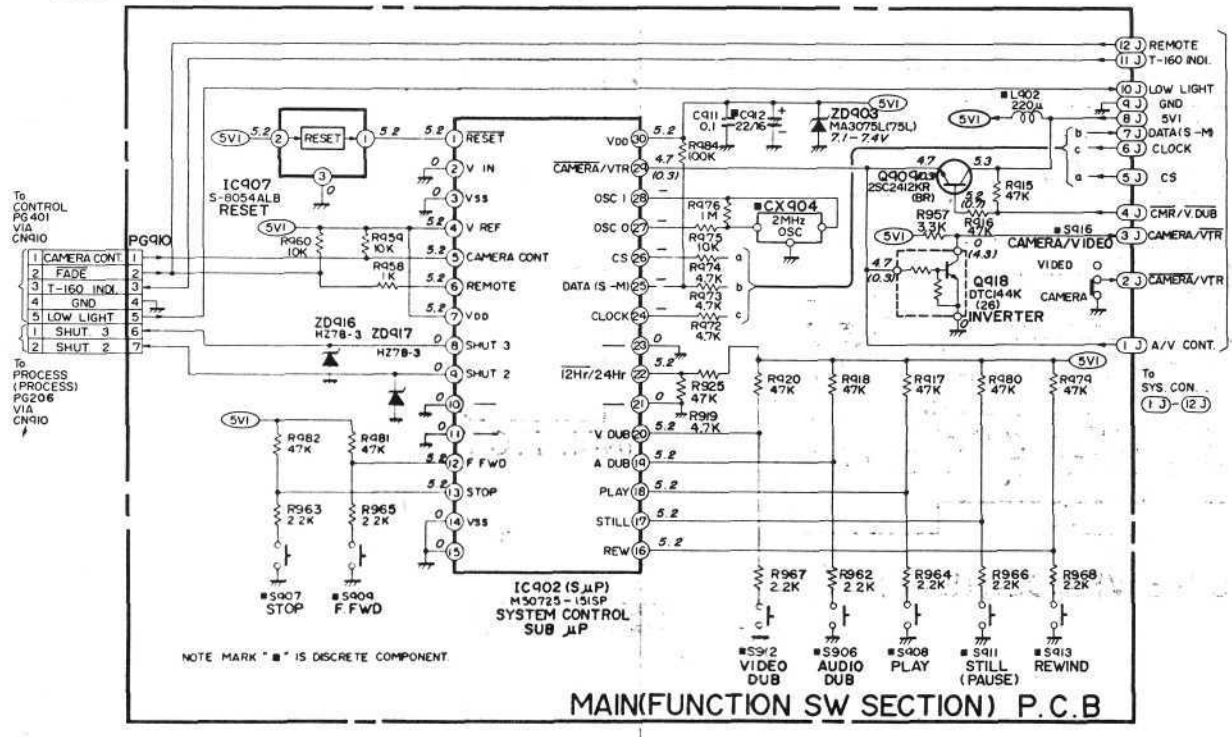


To ZOOM MOTOR CN4A

NOTE:MARK "Ⓩ" IS LEAD

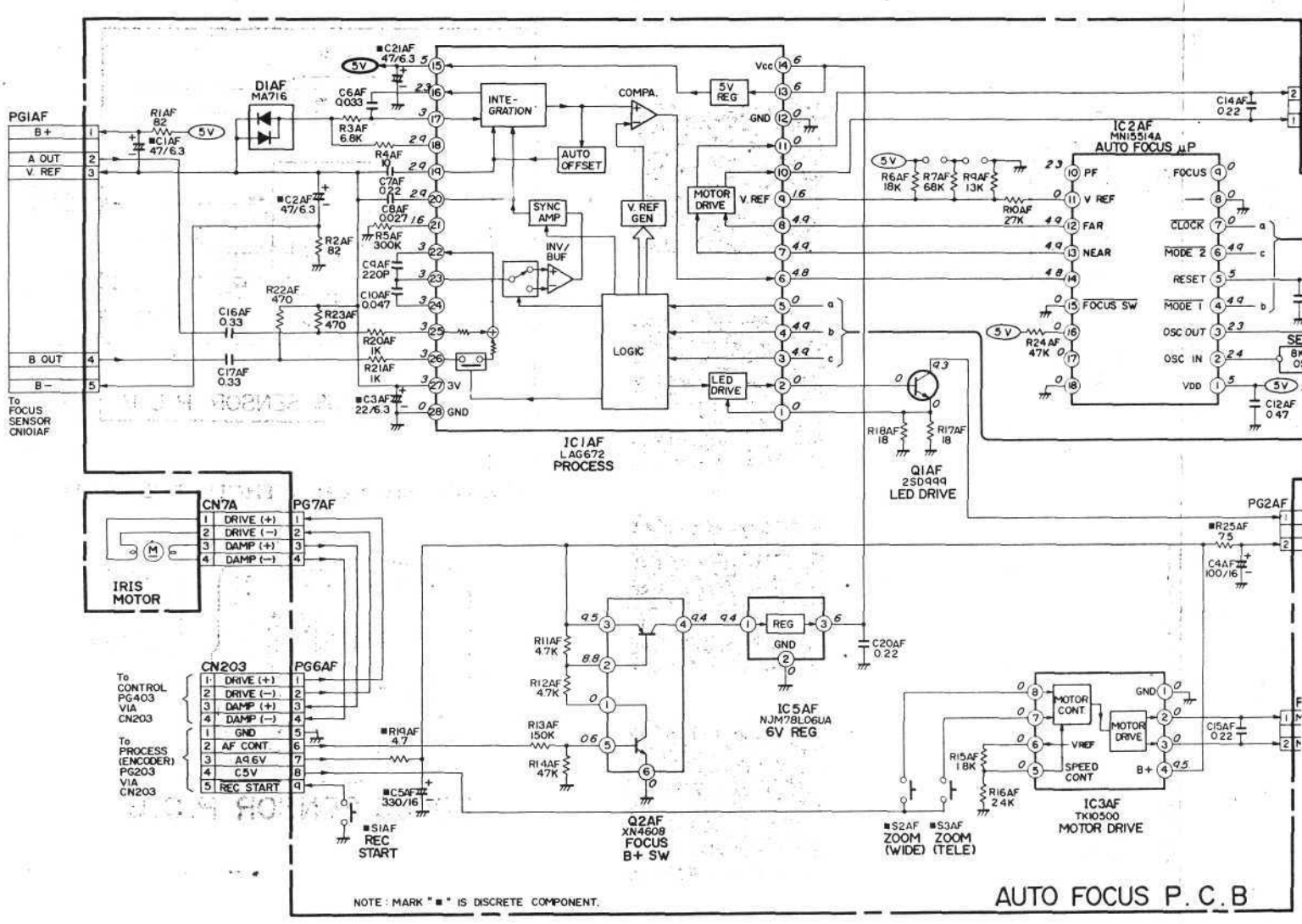
S DISCRETE COMPONENT.

MAIN (FUNCTION SW SECTION) SCHEMATIC

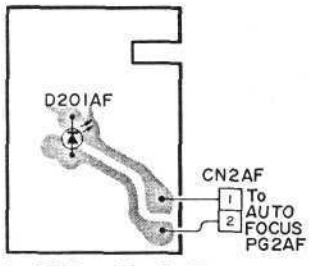


	PAGE
	5-19
	5-31
	5-16
	5-29
	5-25
	5-36
	5-15
ER, INDI.	5-17
	5-18
	5-19
	5-27
	5-32
	5-11
	5-26
	5-7
-UP	5-21
	5-23
	5-35
	5-33

AUTO FOCUS, LED SCHEMATIC

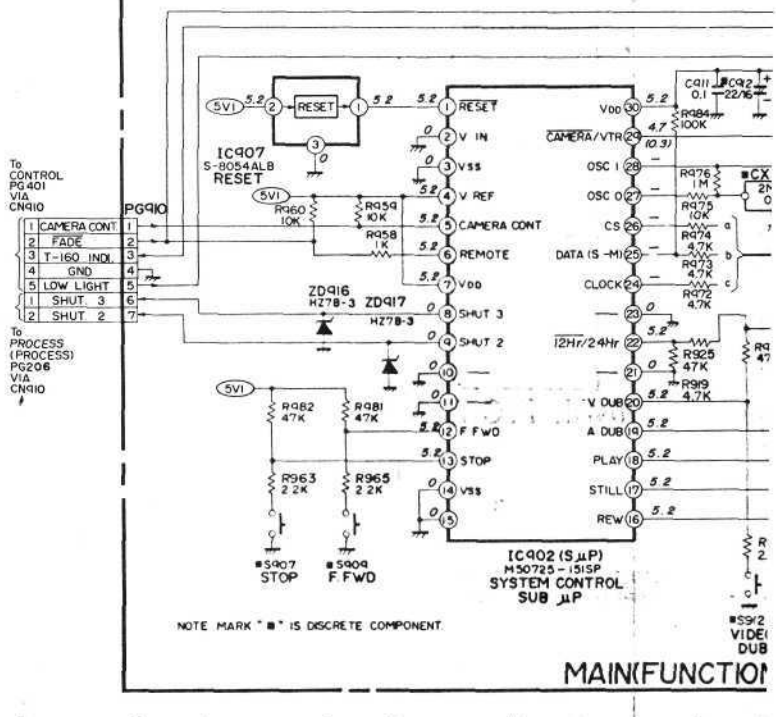


LED CIRCUIT BOARD



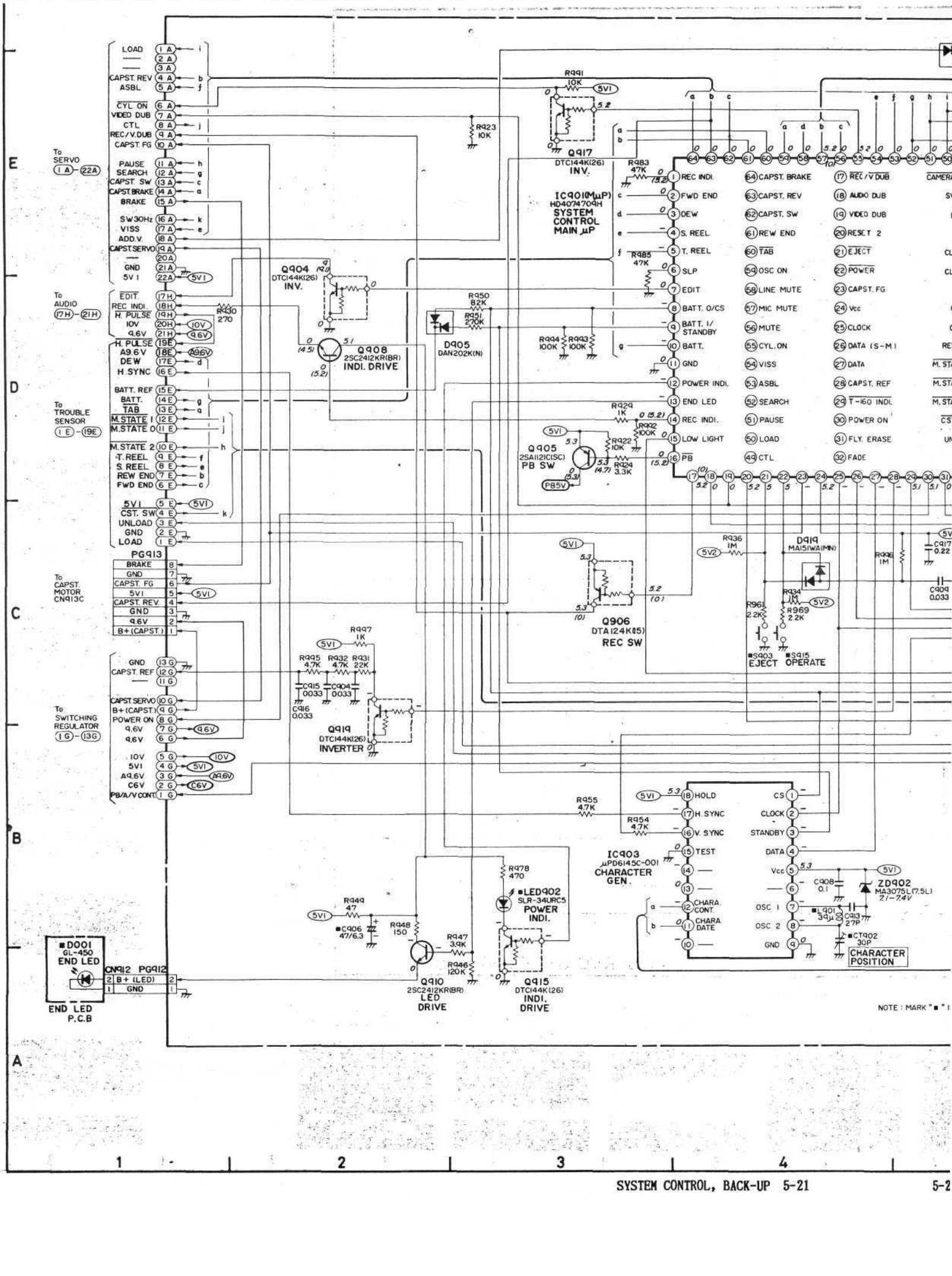
LED P.C.B

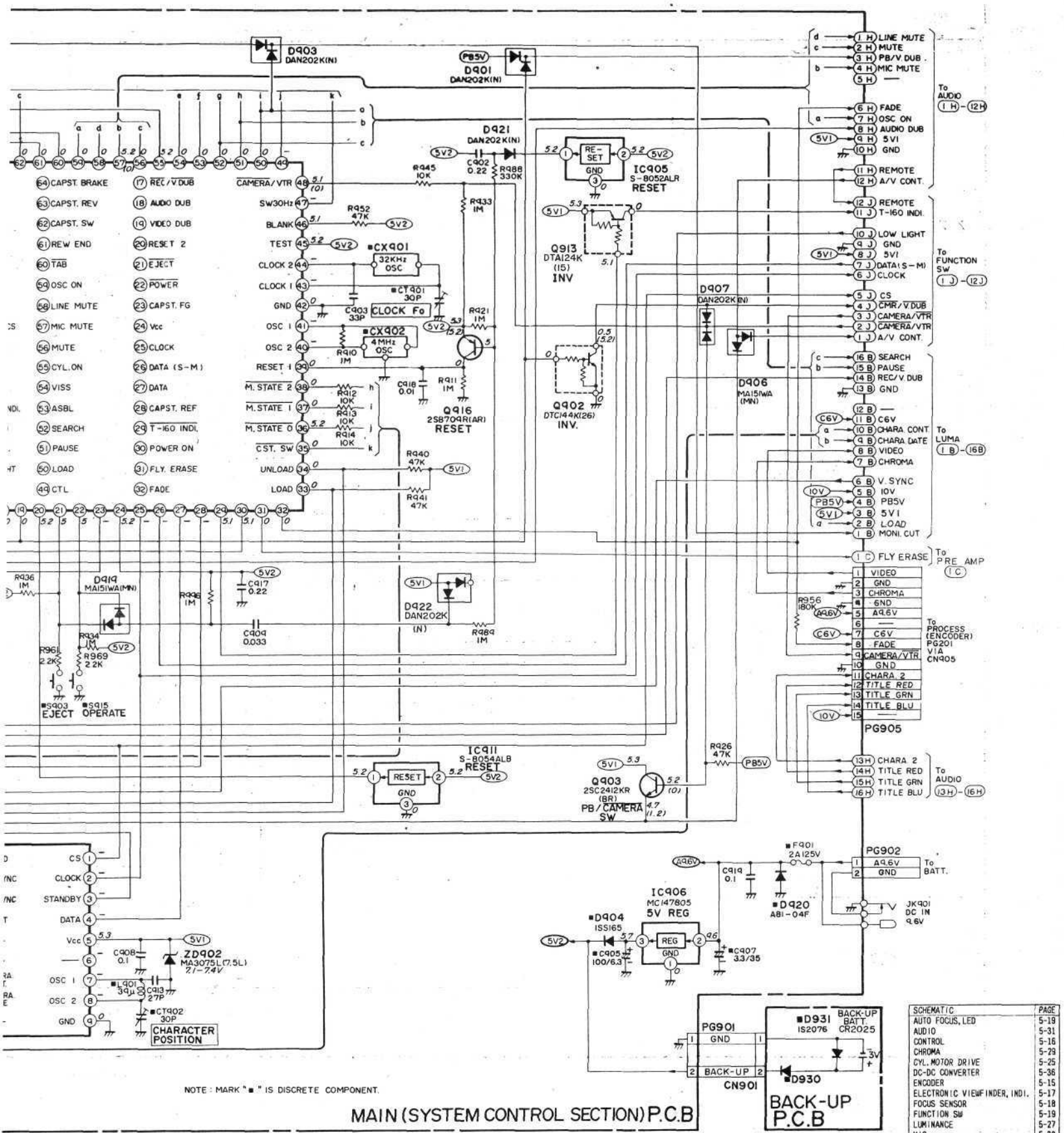
MAIN (FUNCTION SW SECTION) SCHEMATIC



SCHEMATIC	PAGE
AUTO FOCUS, LED	5-19
AUDIO	5-31
CONTROL	5-16
CHROMA	5-29
CYL. MOTOR DRIVE	5-25
DC-DC CONVERTER	5-36
ENCODER	5-15
ELECTRONIC VIEWFINDER, INDI.	5-17
FOCUS SENSOR	5-18
FUNCTION SW	5-19
LUMINANCE	5-27
MIC	5-32
PROCESS	5-11
PRE AMP	5-26
SENSOR	5-7
SYCTEM CONTROL, BACK-UP	5-21
SERVO	5-23
SWITCHING REGULATOR	5-35
TROUBLE SENSOR	5-33

MAIN (SYSTEM CONTROL SECTION), BACK-UP SCHEMATIC



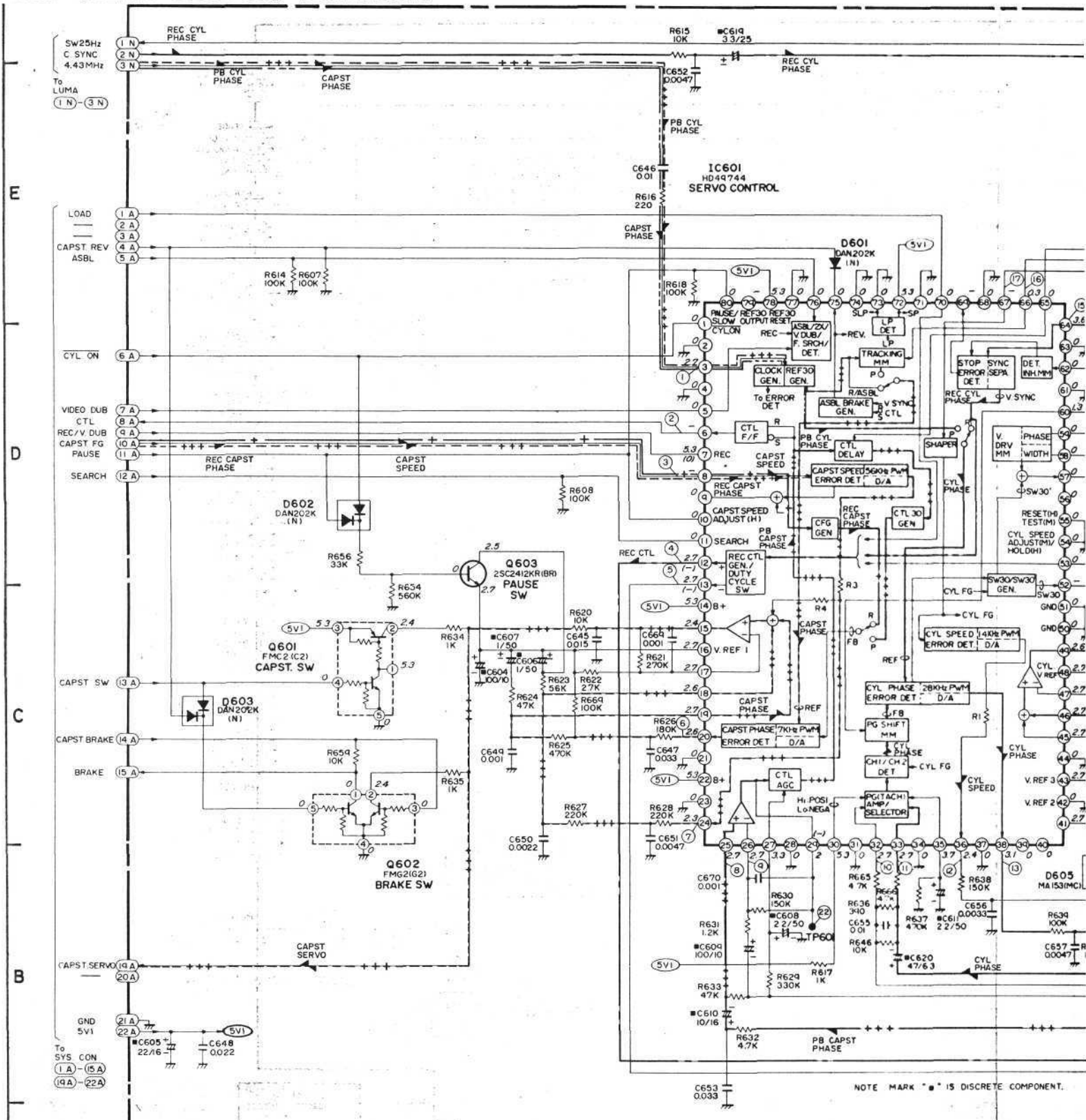


NOTE : MARK "■ " IS DISCRETE COMPONENT.

MAIN (SYSTEM CONTROL SECTION) P.C.B

SCHEMATIC	PAGE
AUTO FOCUS, LED	5-19
AUDIO	5-31
CONTROL	5-16
CHROMA	5-29
CYL. MOTOR DRIVE	5-25
DC-DC CONVERTER	5-36
ENCODER	5-15
ELECTRONIC VIEWFINDER, INDI.	5-17
FOCUS SENSOR	5-18
FUNCTION SW	5-19
LUMINANCE	5-27
MIC	5-32
PROCESS	5-11
PRE AMP	5-26
SENSOR	5-7
SYCTEM CONTROL, BACK-UP	5-21
SERVO	5-23
SWITCHING REGULATOR	5-35
TROUBLE SENSOR	5-33

MAIN (SERVO SECTION) SCHEMATIC



— + — : REC CAPST SIGNAL — +++ — : PB CAPST SIGNAL – – +++ – – : REC/PB CAPST SIGNAL — – – — : REC CYL SIGNAL — – – – – : PB CYL SIGNAL ——— : REC/PB SIG

1-A IC601-3 770mVp-p 0.2V/200nsec. cm REC/PLAY

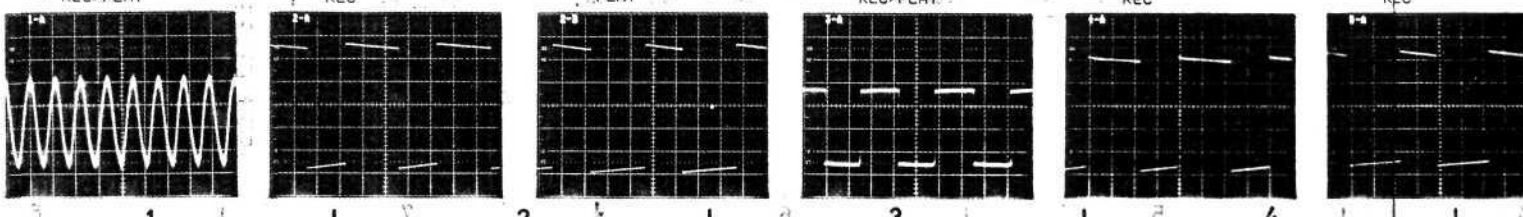
2-A IC601-6 5.0Vp-p 1V/10.0msec. cm REC

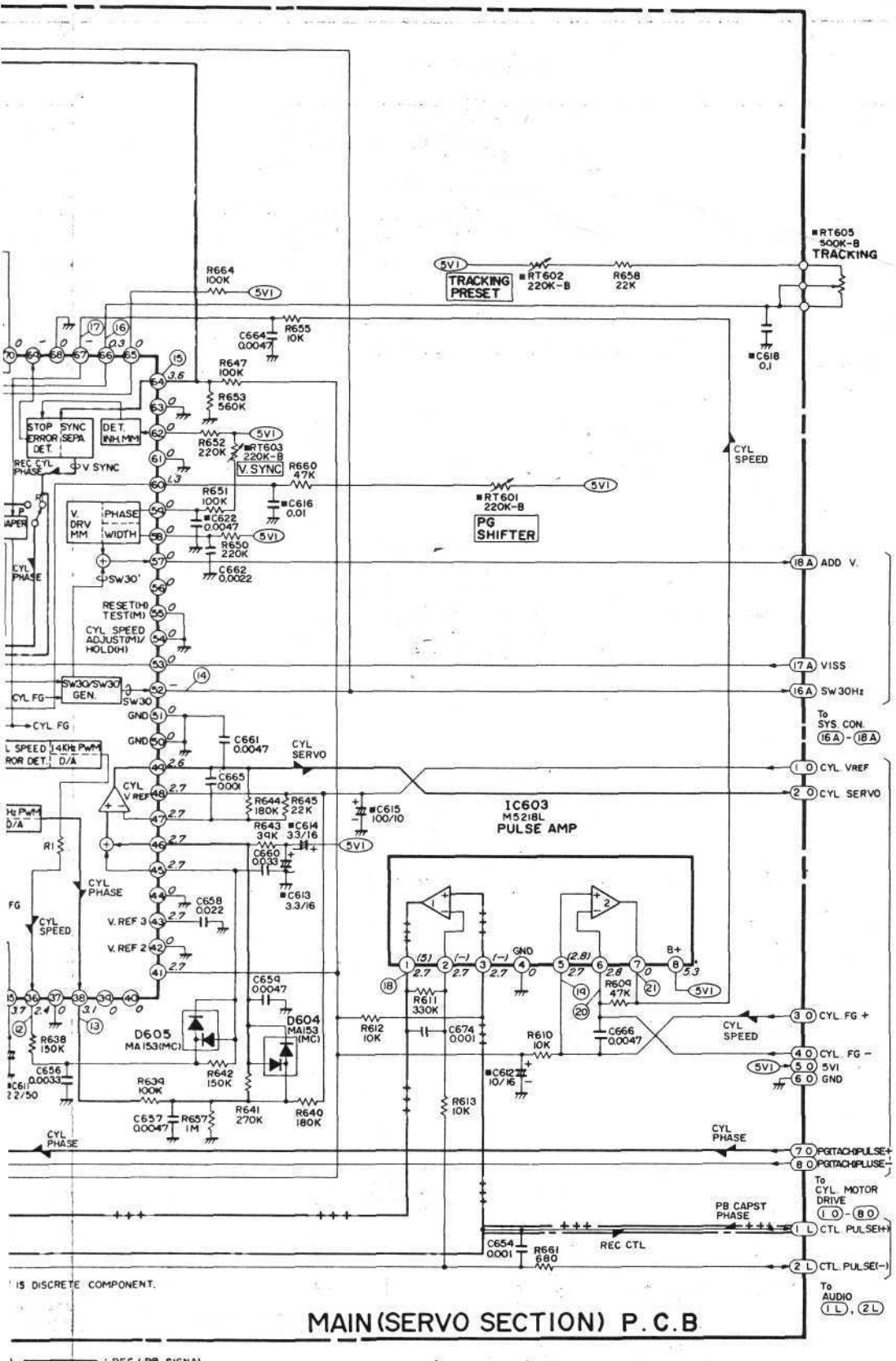
2-B IC601-6 5.0Vp-p 1V/10.0msec. cm PLAY

3-A IC601-8 3.3Vp-p 1V/200μ sec. cm REC/PLAY

4-A IC601-12 5.1Vp-p 1V/10.0msec. cm REC

5-A IC601-13 5.1Vp 1V/10.0msec. cm REC

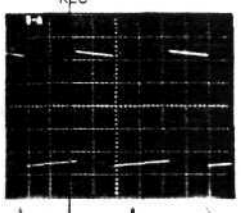




MAIN (SERVO SECTION) P.C.B

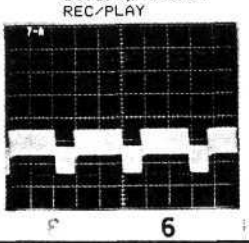
L ——— : REC / PB SIGNAL

5-A IC601-13 5.1Vp-p
1V/10.0msec. cm
REC

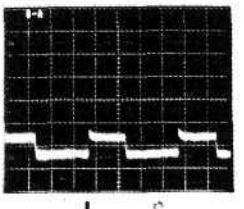


6-A IC601-20 4.2Vp-p
1V/20.0μ sec. cm
REC/PLAY

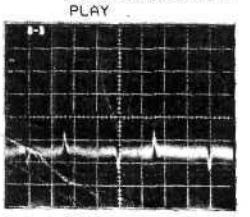
7-A IC601-24 2.0Vp-p
1V/5.0μ sec. cm
REC/PLAY



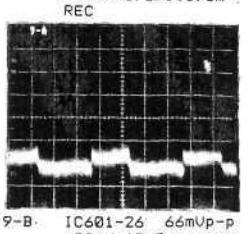
8-A IC601-25 110mVp-p
0.1V/10.0msec. cm
REC



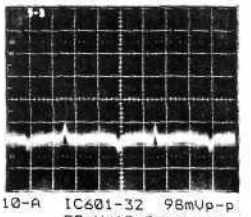
8-B IC601-25 100mVp-p
50mV/10.0msec. cm
PLAY



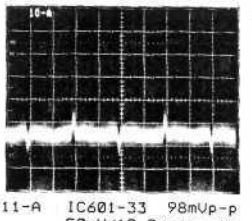
9-A IC601-26 46mVp-p
50mV/10.0msec. cm
REC



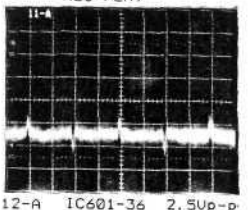
9-B IC601-26 66mVp-p
50mV/10.0msec. cm
PLAY



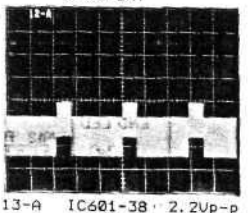
10-A IC601-32 98mVp-p
50mV/10.0msec. cm
REC/PLAY



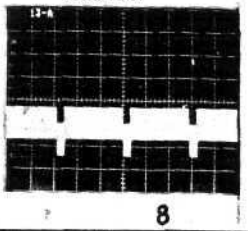
11-A IC601-33 98mVp-p
50mV/10.0msec. cm
REC/PLAY

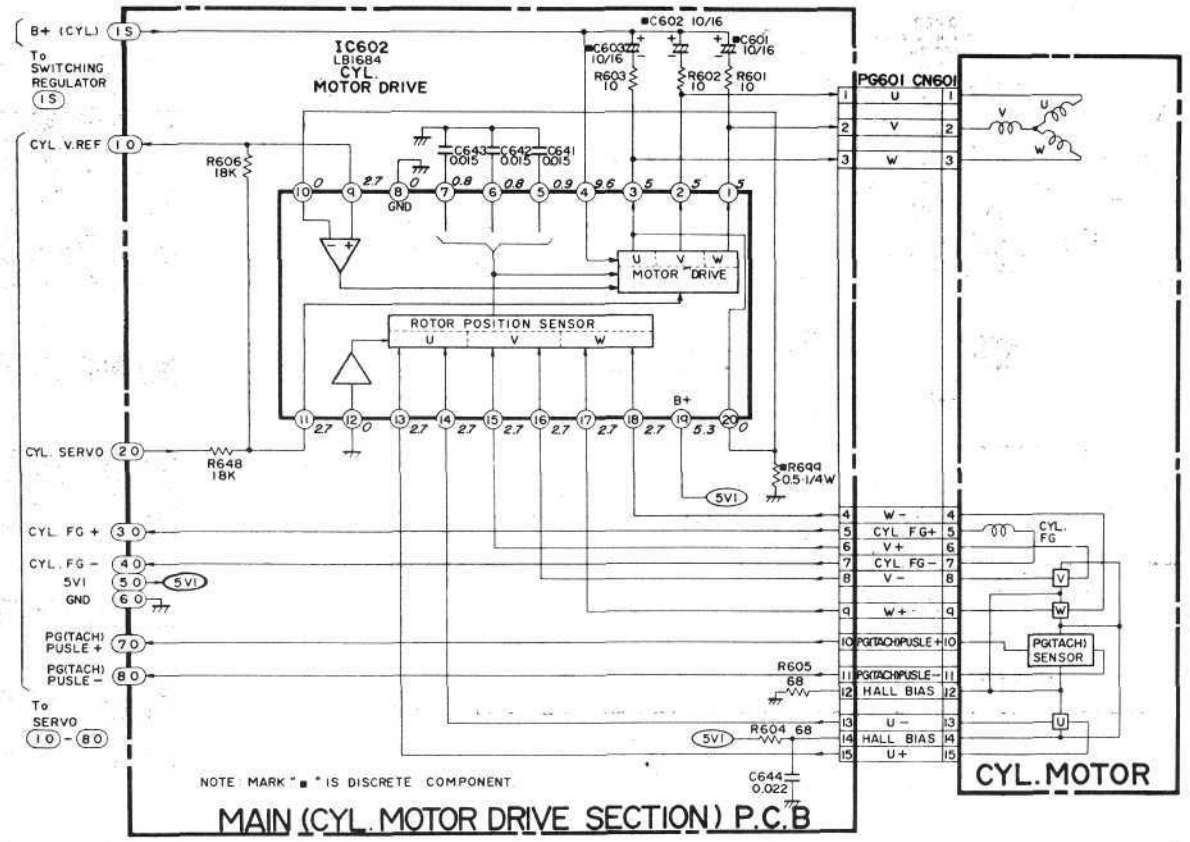


12-A IC601-36 2.5Vp-p
1V/20.0μ sec. cm
REC/PLAY

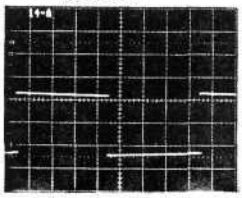


13-A IC601-38 2.2Vp-p
1V/10.0μ sec. cm
REC/PLAY

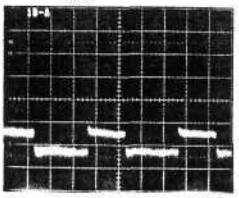




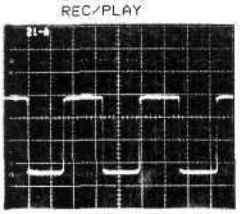
14-A IC601-52 5.7Vp-p 2V/5.0msec.cm REC/PLAY



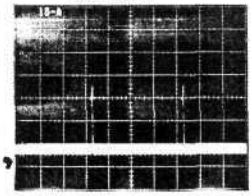
18-A IC603-1 150mVp-p 0.1V/10.0msec.cm REC



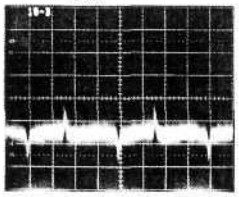
21-A IC603-7 3.4Vp-p 1V/1.0msec.cm REC/PLAY



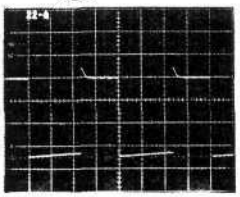
15-A IC601-64 3.0Vp-p 1V/5.0msec.cm REC/PLAY



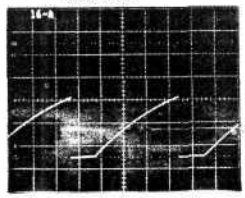
18-B IC603-1 110mVp-p 50mV/10.0msec.cm PLAY



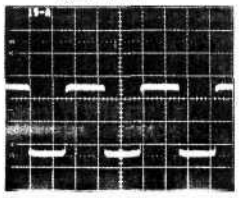
22-A TP601 3.9Vp-p 1V/10.0msec.cm REC



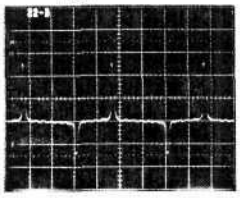
16-A IC601-66 2.6Vp-p 1V/10.0msec.cm REC/PLAY



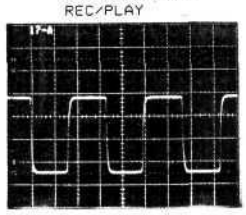
19-A IC603-5 610mVp-p 0.2V/1.0msec.cm REC/PLAY



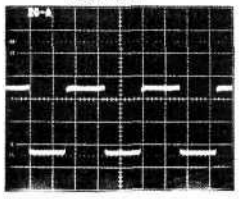
22-B TP601 4.0Vp-p 1V/10.0msec.cm PLAY



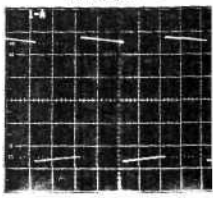
17-A IC601-67 3.4Vp-p 1V/1.0msec.cm REC/PLAY



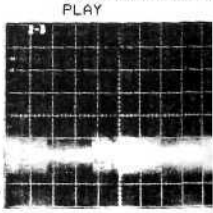
20-A IC603-6 610mVp-p 0.2V/1.0msec.cm REC/PLAY



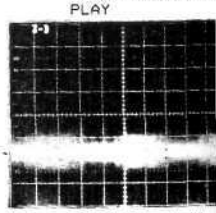
1-A IC201-2 5.0Vp-p 1V/10.0msec.cm REC/PLAY



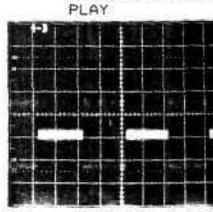
2-B IC201-8 30mVp-p 20mV/10.0msec.cm PLAY



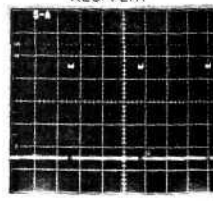
3-B IC201-10 30mVp-p 20mV/10.0msec.cm PLAY



4-B IC201-20 1.6Vp-p 0.5V/10.0msec.cm PLAY

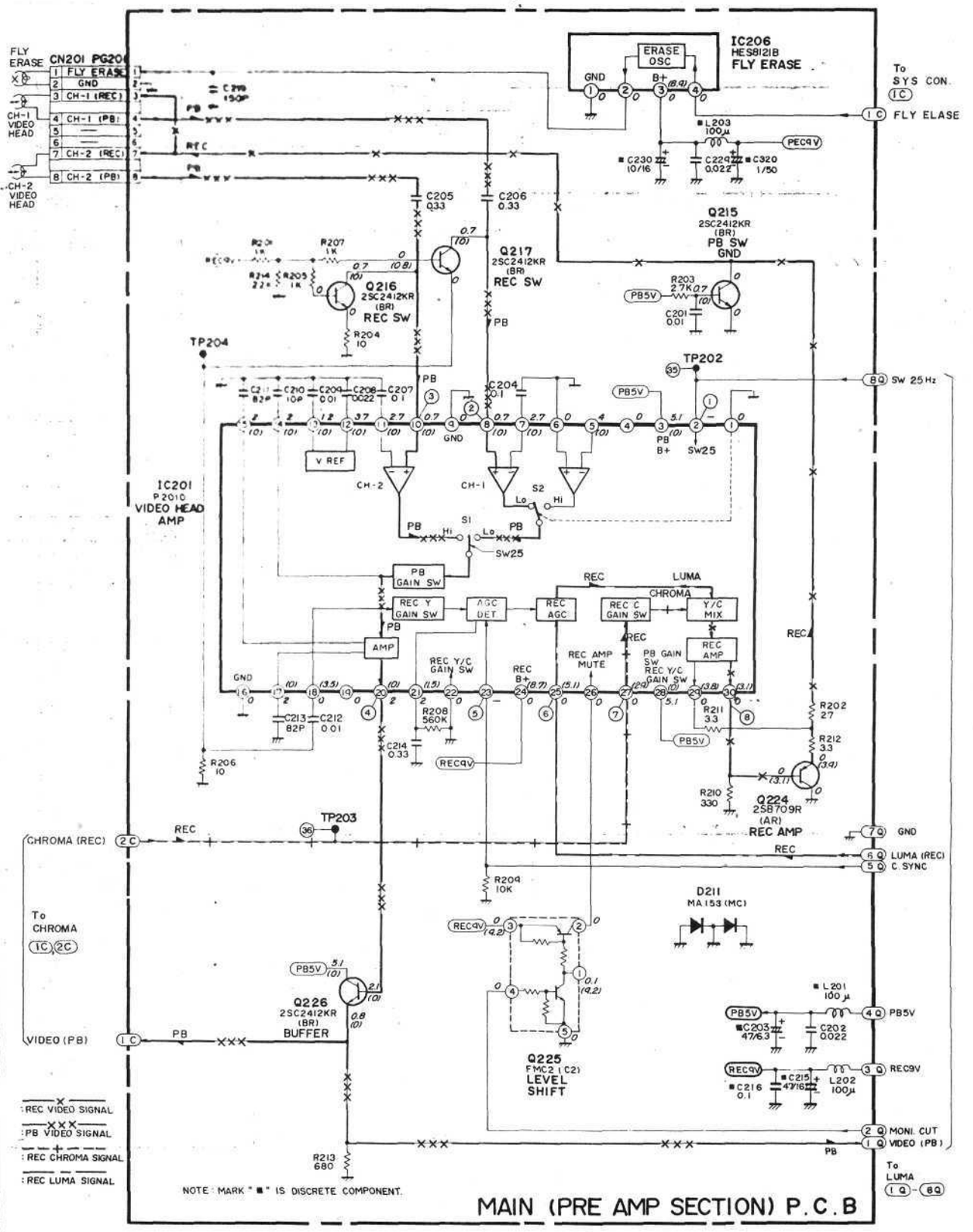


5-A IC201-23 4.1Vp-p 1V/20.0μsec.cm REC/PLAY

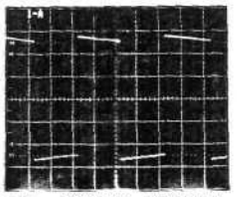


SCHEMATIC	PAGE
AUTO FOCUS, LED	5-19
AUDIO	5-31
CONTROL	5-16
CHROMA	5-29
CYL. MOTOR DRIVE	5-25
DC-DC CONVERTER	5-36
ENCODER	5-15
ELECTRONIC VIEWFINDER, INDI.	5-17
FOCUS SENSOR	5-18
FUNCTION SW	5-19
LUMINANCE	5-27
MIC	5-32
PROCESS	5-11
PRE AMP	5-26
SENSOR	5-7
SYCTEM CONTROL, BACK-UP	5-21
SERVO	5-23
SWITCHING REGULATOR	5-35
TROUBLE SENSOR	5-33

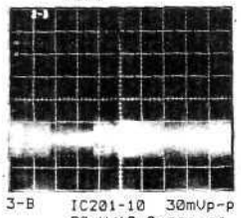
MAIN (PRE AMP SECTION) SCHEMATIC



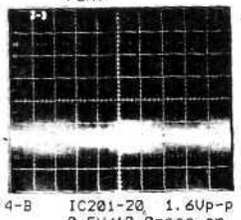
1-A IC201-2 5.0Vp-p 1V/10.0msec.cm REC/PLAY



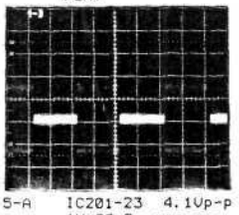
2-B IC201-8 30mVp-p 20mV/10.0msec.cm PLAY



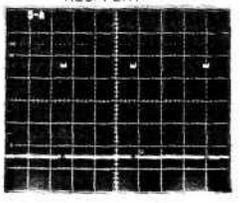
3-B IC201-10 30mVp-p 20mV/10.0msec.cm PLAY



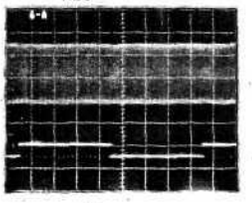
4-B IC201-20 1.6Vp-p 0.5V/10.0msec.cm PLAY



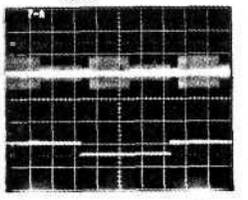
5-A IC201-23 4.1Vp-p 1V/20.0µ sec.cm REC/PLAY



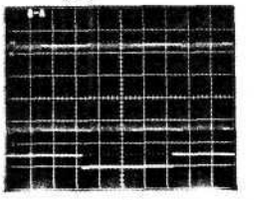
6-A IC201-25 540mVp-p 0.2V/5.0msec.cm REC



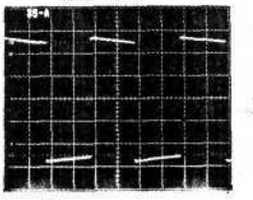
7-A IC201-27 160mVp-p 0.1V/5.0msec.cm REC



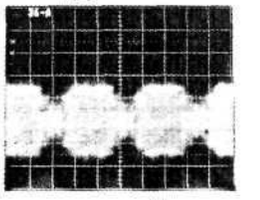
8-A IC201-30 4.2Vp-p 1V/5.0msec.cm REC



35-A TP202 5.0Vp-p 1V/5.0msec.cm REC/PLAY

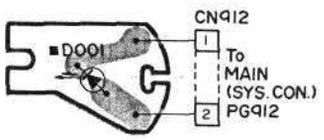


36-A TP203 150mVp-p 50mV/20.0µ sec.cm REC



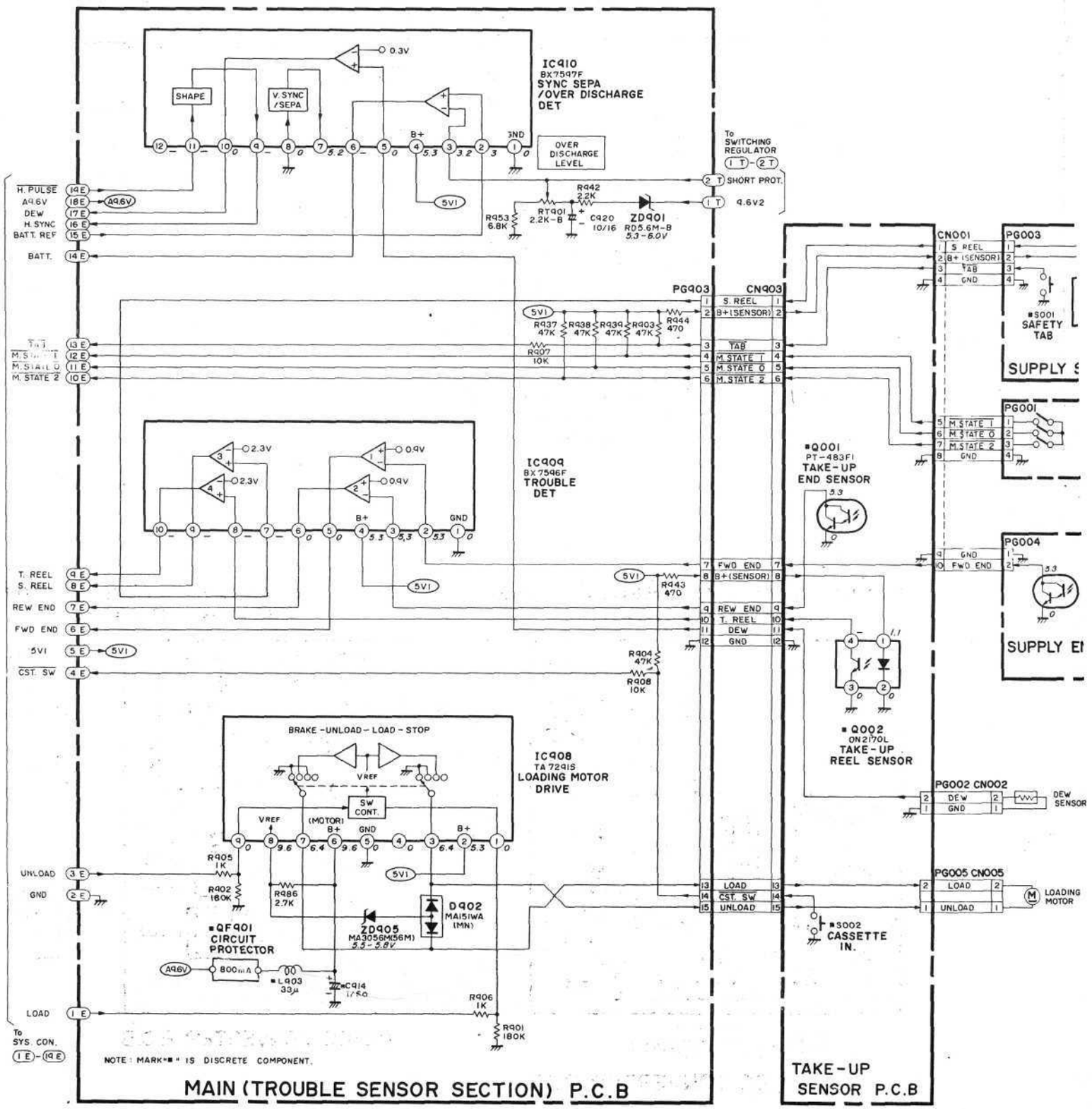
4 | 5 | 6 | 7 | 8

END LED CIRCUIT BOARD



END LED P.C.B

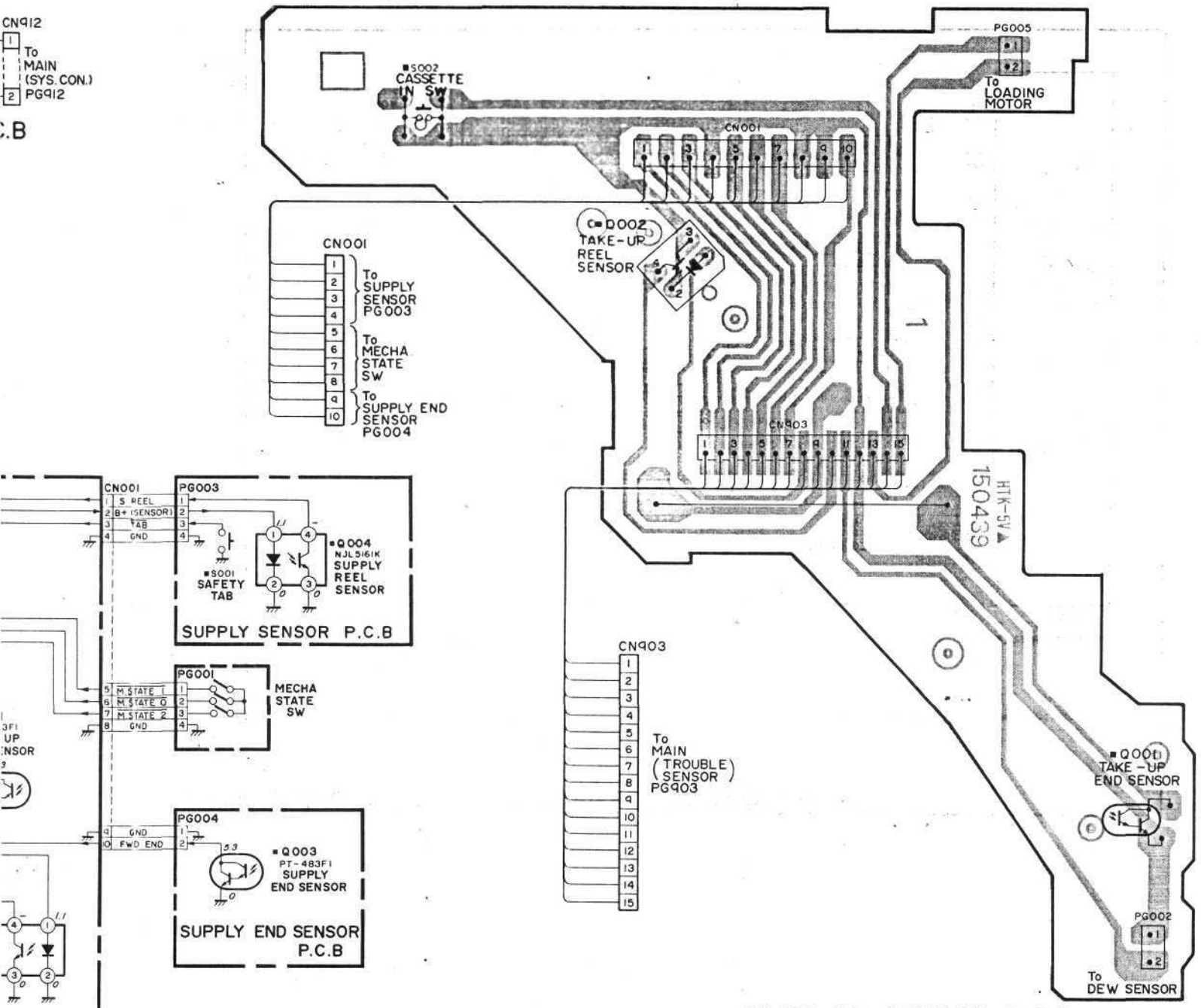
MAIN (TROUBLE SENSOR SECTION) SCHEMATIC



CUIT BOARD

CN912
To MAIN (SYS. CON.) PG912
C.B

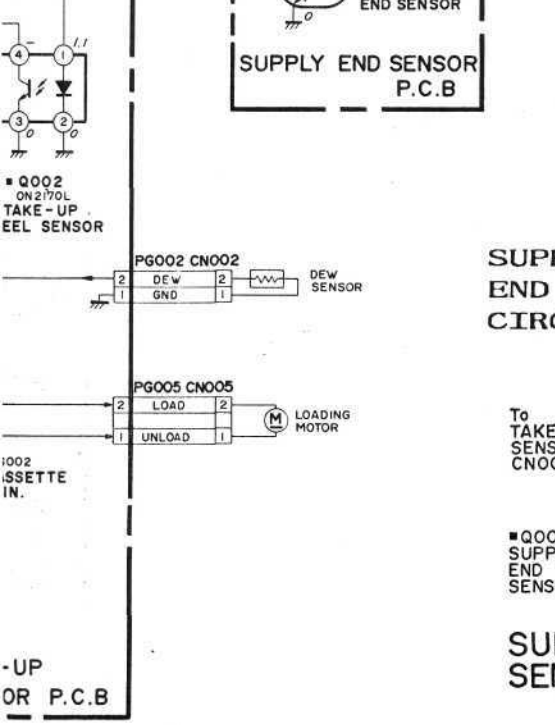
TAKE-UP SENSOR CIRCUIT BOARD



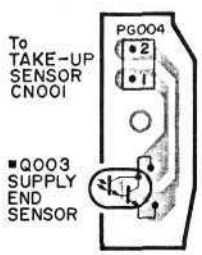
TAKE-UP SENSOR P.C.B

SUPPLY SENSOR P.C.B

SUPPLY END SENSOR P.C.B

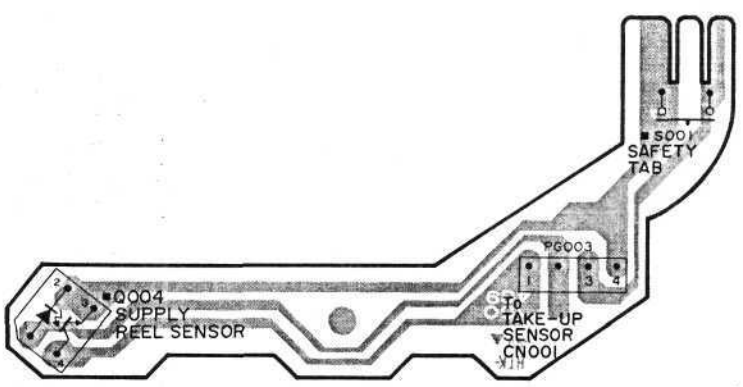


SUPPLY END SENSOR CIRCUIT BOARD



SUPPLY END SENSOR P.C.B

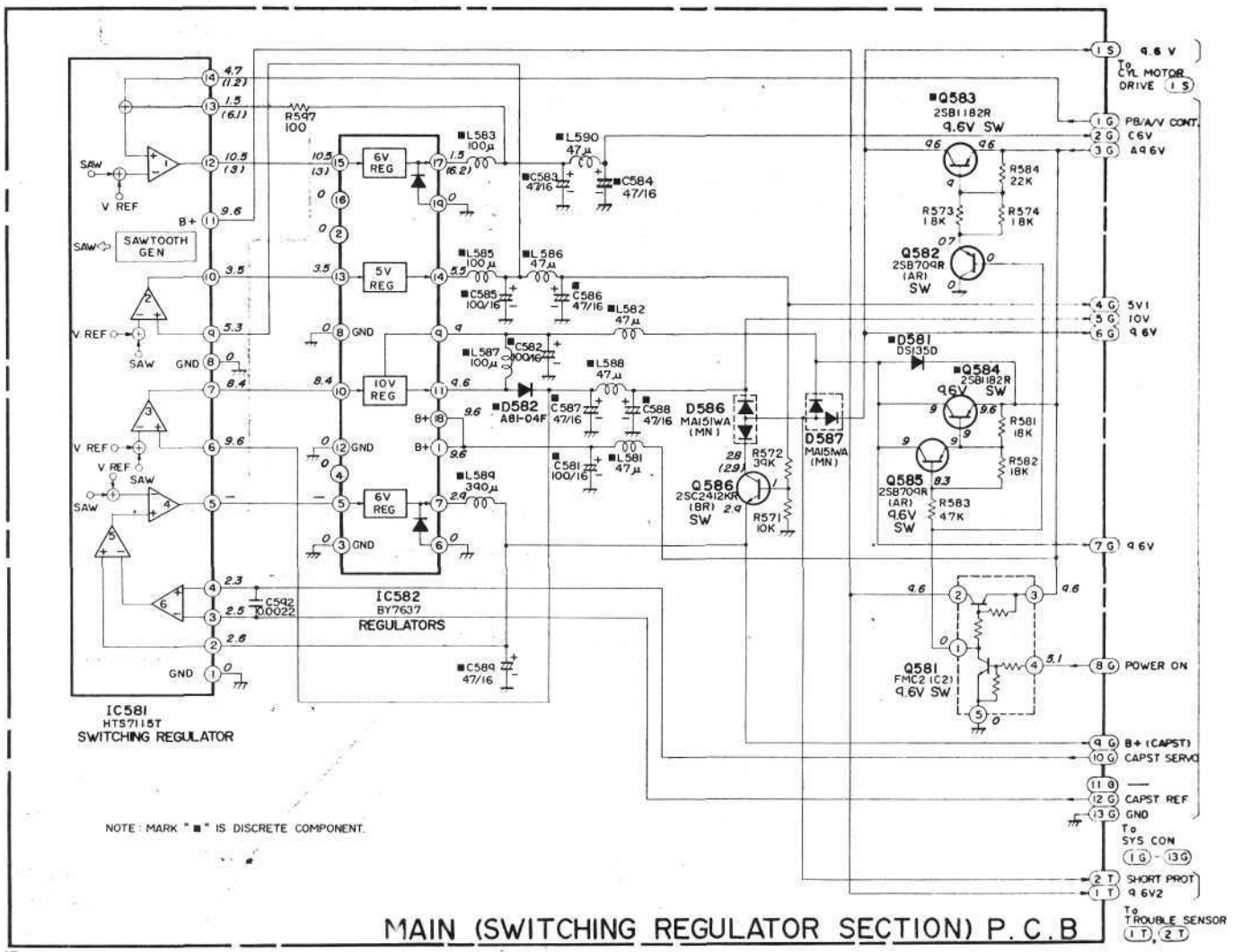
SUPPLY SENSOR CIRCUIT BOARD



SUPPLY SENSOR P.C.B

4 5 6 7 8

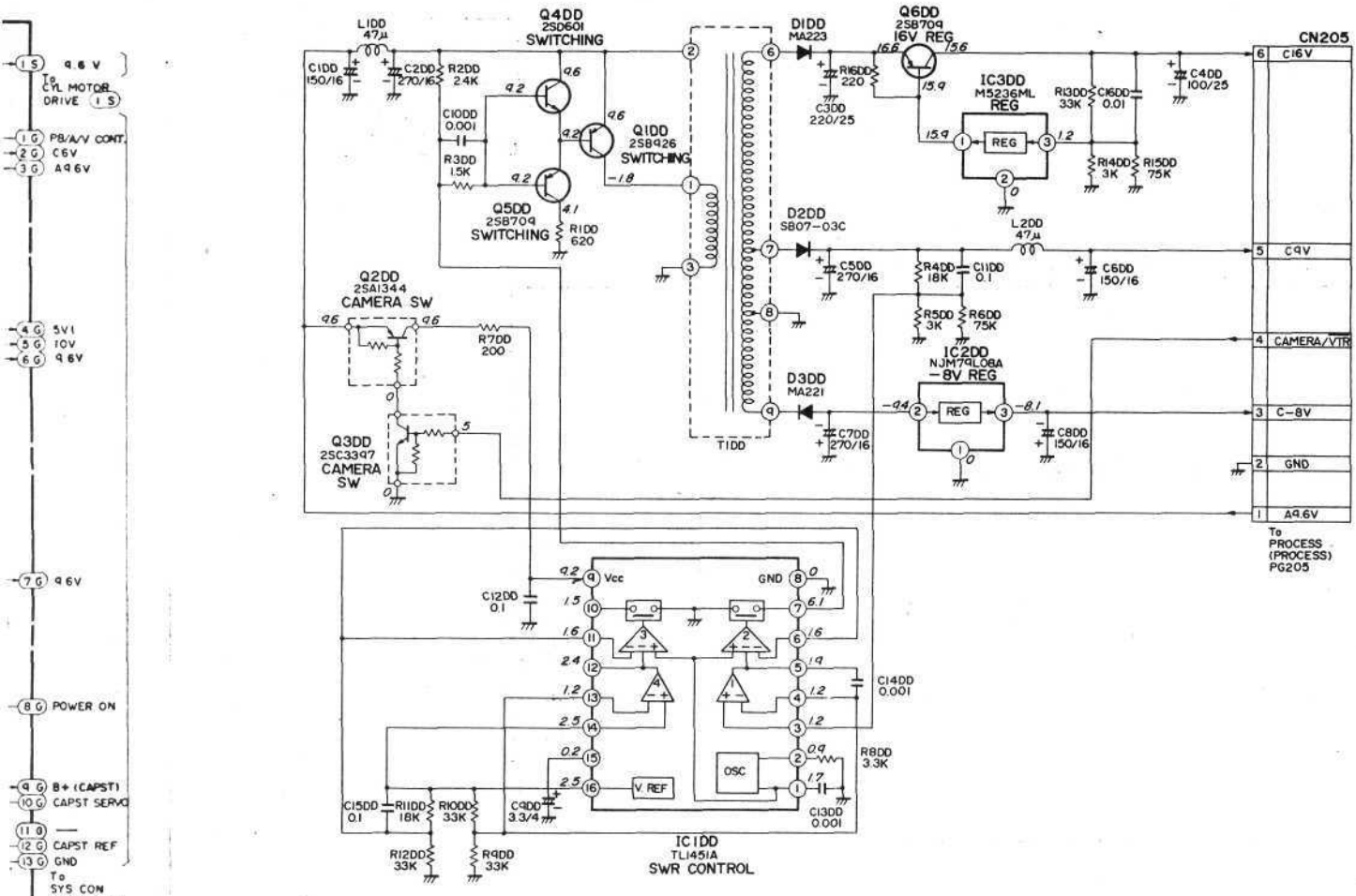
MAIN (SWITCHING REGULATOR SECTION) SCHEMATIC



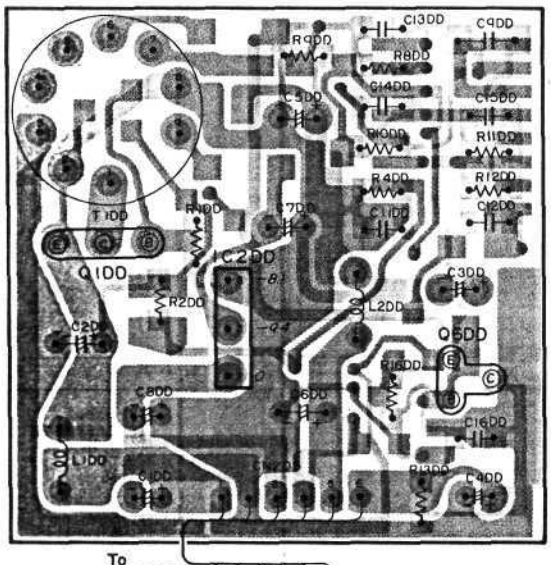
MAIN (SWITCHING REGULATOR SECTION) P.C.B

SCHEMATIC	PAGE
AUTO FOCUS, LED	5-19
AUDIO	5-31
CONTROL	5-16
CHROMA	5-29
CYL. MOTOR DRIVE	5-25
DC-DC CONVERTER	5-36
ENCODER	5-15
ELECTRONIC VIEWFINDER, INDI.	5-17
FOCUS SENSOR	5-18
FUNCTION SW	5-19
LUMINANCE	5-27
MIC	5-32
PROCESS	5-11
PRE AMP	5-26
SENSOR	5-7
SYCTEM CONTROL, BACK-UP	5-21
SERVO	5-23
SWITCHING REGULATOR	5-35
TROUBLE SENSOR	5-33

DC-DC CONVERTER SCHEMATIC

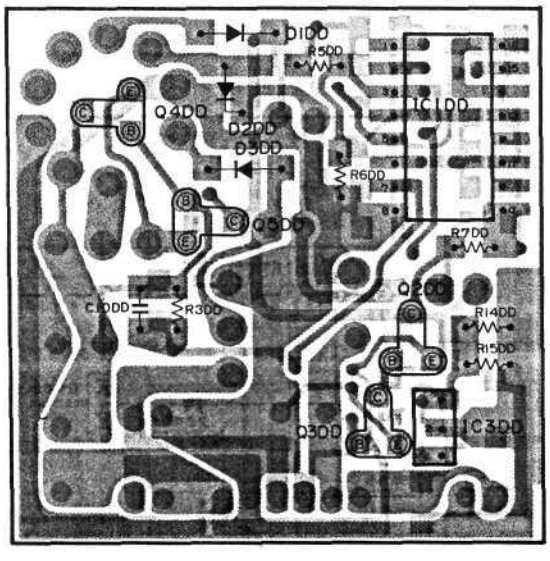


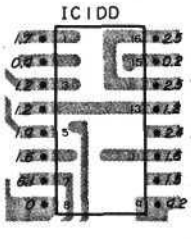
DC-DC CONVERTER CIRCUIT BOARD (COMPONENT SIDE)

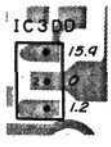


DC-DC CONVERTER P.C.B

DC-DC CONVERTER CIRCUIT BOARD (SOLDER SIDE)

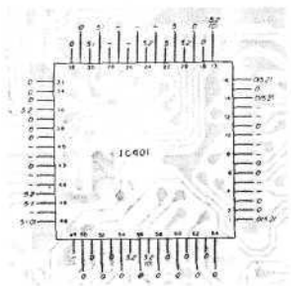


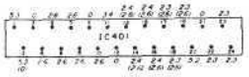


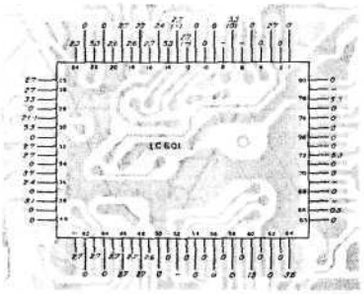


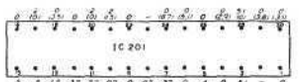
DC-DC CONVERTER P.C.B

MAIN CIRCUIT BOARD







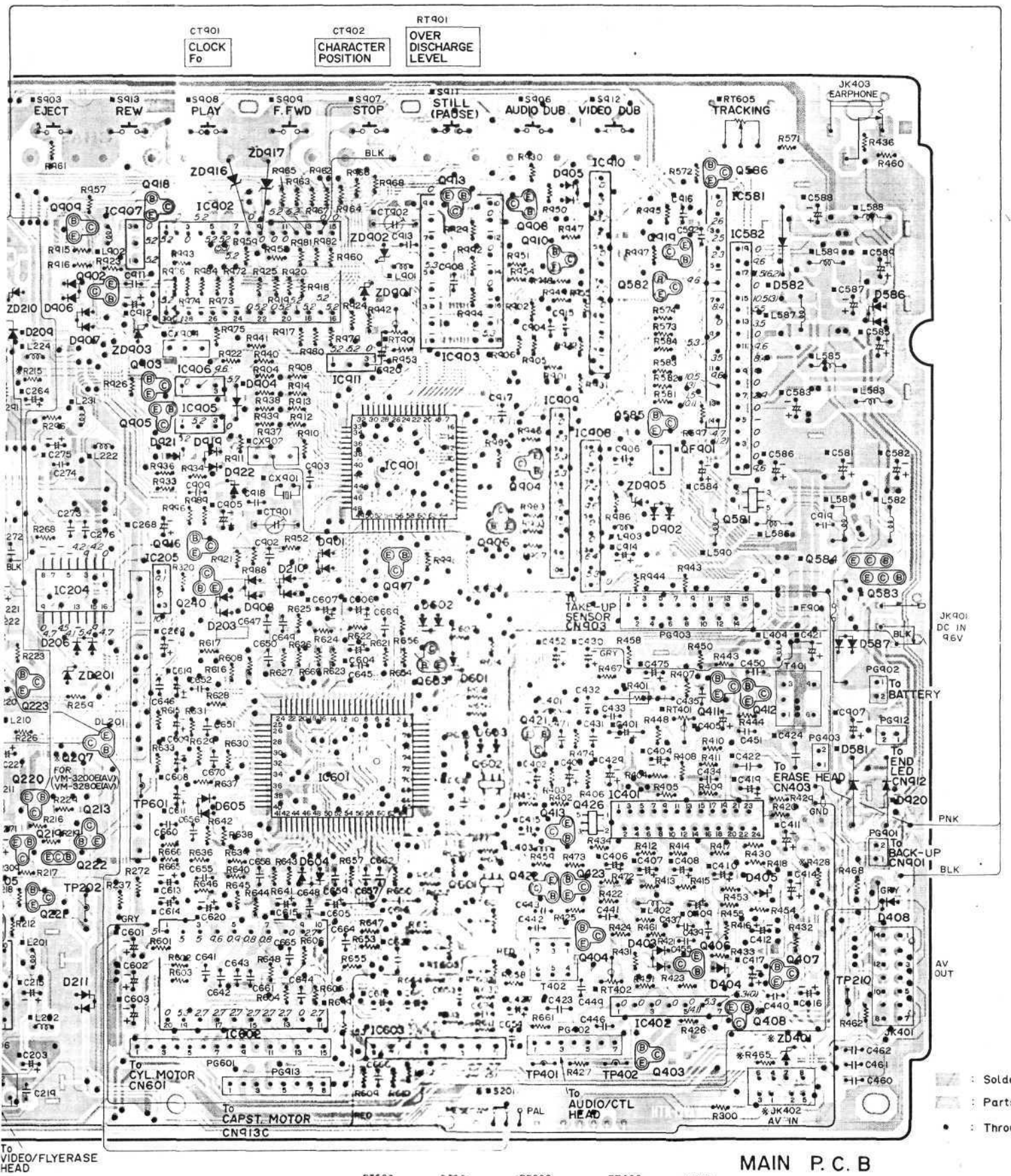


	JK402	S201	ZD401	R426	R465	Q408	Q207	RT201
VM-3200E(AV)	○	○	○	○	○	○	○	○
VM-3280E(AV)	○	○	○	○	○	○	○	○
VM-3280E(AU)	○	×	○	○	○	○	○	○

○ : PROVIDE × : NOT PROVIDE

NOTE: MARK " ■ " IS DISCRETE COMPONENT.

RT201
REC CHROMA LEVEL


CT901
CLOCK
Fo
CT902
CHARACTER
POSITION
RT901
OVER
DISCHARGE
LEVEL
S903
EJECT
S913
REW
S908
PLAY
S909
F.FWD
S907
STOP
S911
STILL
(PAUSE)
S906
AUDIO DUB
S912
VIDEO DUB
RT605
TRACKING
JK403
EARPHONE
IC901
IC902
IC903
IC904
IC905
IC906
IC907
IC908
IC910
IC911
IC204
IC205
IC581
IC582
IC601
IC602
IC603
IC401
IC402
Q583
Q584
Q585
Q586
Q587
Q588
Q589
Q590
Q591
Q592
Q593
Q594
Q595
Q596
Q597
Q598
Q599
Q600
Q601
Q602
Q603
Q604
Q605
Q606
Q607
Q608
Q609
Q610
Q611
Q612
Q613
Q614
Q615
Q616
Q617
Q618
Q619
Q620
Q621
Q622